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ACUTE ANTERIOR POLIOMYELITIS AND VITAMIN B DEFICIENCY.

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AN outstanding feature in the epidemiology of acute anterior poliomyelitis is its low incidence. Manifest disease occurs in only a small proportion of persons who appear to be in contact with the infective agent. In a large aggregation of people, such as a city with over 100,000 inhabitants, epidemics seldom attack more than one in 1,000 of the population.⁽¹⁾ The incidence of poliomyelitis, even in epidemics, is frequently less than the usual annual incidence of several of the more common infectious diseases, and strikingly less than the incidence which these common diseases frequently attain during epidemics.

The relative immunity of adults and older children to the disease has been explained by the prevalence of mild or subclinical infections. It has been found that the serum from older persons neutralizes the virus *in vitro* more frequently than serum from younger children.⁽²⁾ The significance of the presence of neutralizing substances in human serum has lately been discussed by two groups of investigators. Brodie⁽³⁾ and Burnet⁽⁴⁾ and their co-workers have shown that the presence of antibodies does not necessarily give protection against an attack of the disease. The presence or absence of antibodies in serum does not alone determine whether infection will or will not occur. Brodie, however, did observe that there appeared to be some correlation between the incidence of paralysis and the presence of immune bodies. Fewer persons with immune bodies developed paralysis.

Several authorities consider that the virus of poliomyelitis is exclusively, or almost exclusively, neurotropic.^{(5) (6) (7)} Faber⁽⁸⁾ states: "Its natural host is the nerve

cell, and it has no known capacity for multiplication in any other type of tissue." The virus has a striking tendency to die out at any stage of the disease, and as a result of this tendency there is wide variation in the clinical signs and symptoms.⁽⁹⁾ The only evidence of infection may be fever, pain and stiffness in the neck and back, which abate in two or three days. Transitory weakness, ataxia, or evidence of temporary involvement of one cranial nerve is sometimes found. On the other hand, there may be widespread paralysis which swiftly spreads to involve almost every muscle in the body. It appears, from the cases in which a sudden spread of paralysis occurs weeks after the initial attack,^{(10) (11)} that the virus can in some instances remain alive in the host for prolonged periods without causing destruction of nerve cells. It is possible that the physiology of the nerve cell may shed some light on its power to resist the virus in some instances, on its vulnerability to attack by the virus in others, and on the tendency of the virus to die at any stage of the disease.

Much work has been done on the relation between the vitamin B complex and the nervous system. This applies particularly to vitamin B₁, and more is known about it than about other components of the complex. In 1938 Shattuck⁽¹²⁾ stated: "Substances contained in the vitamin B complex are known now to be of essential importance for the protection of the nervous system." Wolbach⁽¹³⁾ considers that "the profound functional disturbance of the nervous system [in B₁ hypovitaminosis] and speedy recovery with treatment do indicate that vitamin B₁ is directly concerned in the physiology of neurones . . .", and that "vitamin B₁ . . . must be more directly concerned in the physiology of the nervous system than is any other vitamin". In view of these statements it may not be unprofitable to consider the function of vitamin B₁ and the effects of its deficiency on the nervous system, and to attempt to determine whether such a deficiency predisposes the nerve cells to attack by the virus of acute anterior poliomyelitis.

Function of Vitamin B₁ (Thiamin).

An analysis of all the evidence at present suggests that thiamin is definitely concerned with tissue respiration.⁽¹¹⁾ The tissues of the nervous system are particularly susceptible to the effects of a deficiency of the vitamin, although there is a simultaneous but less pronounced adverse influence on the function of all other organs.⁽¹²⁾ The respiration of brain is about thirty times as intense as that of muscle or nerve.⁽¹³⁾ Experiments *in vitro* with slices of B₁ avitaminous brains showed that diminished tissue respiration and a lowered taking up of oxygen occurred. Peters came to the conclusion that the lowered oxygen uptake was specific for the lowered vitamin B₁ content. The addition of vitamin B₁ *in vitro* largely restores the oxygen uptake.⁽¹⁴⁾ Peters and his co-workers have demonstrated that vitamin B₁ is a catalyst needed for the oxidative removal of pyruvic acid—one of the lower degradation products of carbohydrate metabolism.⁽¹⁵⁾ In the absence of the vitamin there is an accumulation of pyruvic acid owing to the stoppage of metabolism at this stage. A biochemical lesion is induced in some tissue cells, and therefore their activity is inhibited. The first symptom to be noticed in vitamin B₁ deficiency in animals is lack of appetite. Later there are found decreased sugar tolerance and nervous symptoms; in pigeons opisthotonus, changes in temperature, usually lack of vision and bradycardia and sometimes oedema occur. The pyruvic acid itself is not responsible for the symptoms. They are the result of dysfunction of certain cells in the brain due to failure of oxidation at the pyruvic acid stage.⁽¹⁶⁾ Cure has been shown to take place very rapidly on administration of the vitamin—within one hour when it is injected under the skull. Such rapid recovery shows that the symptoms were not caused by gross histological change.⁽¹⁷⁾

Thiamin Requirement of Man.

There is no consensus of opinion as to the optimum daily intake of thiamin by man. Cowgill⁽¹⁷⁾ states that adults require a minimum of 300 to 350 international units daily (one milligramme of pure thiamin equals 333 international units). This minimum is equal to about ten international units per 100 Calories daily. Pre-school children need as much as 20 to 25 or more international units per 100 Calories daily. Diets associated with beriberi have been found to contain 71 to 382 international units.⁽¹⁸⁾ The capacity of the body to store thiamin appears to be low, and rapid loss from the tissues occurs in short periods of deficiency.⁽¹⁹⁾ It would seem therefore that optimum nutrition cannot be maintained unless the diet regularly contains thiamin in adequate amounts. The minimum requirement is not the optimum requirement.

Factors Favouring Deficiency of Thiamin or Increasing Requirement for Thiamin.

The absolute amount of thiamin required rises in proportion to the food—especially the carbohydrate—metabolized.⁽²⁰⁾ The amount required is also increased by a rise in the metabolic rate from any cause, such as muscular work, pregnancy, fever or hyperthyroidism.^{(19) (20)} "When the caloric content of the diet is high or the total energy expended is high, and the vitamin intake is low, vitamin deficiency in many instances develops relatively easily and rapidly."⁽²¹⁾ Such disorders are particularly apt to develop at a time in life when the demands for them are greatest, namely, in infancy and childhood, owing to growth, and in pregnancy and the puerperium, when the physiological strain of child-bearing and lactation requires dietary factors to be from 10% to 100% greater than the standard requirement for normal women.⁽²²⁾

Thiamin is destroyed in an alkaline medium, and achlorhydria may cause its destruction in the alimentary tract. Defective absorption may be brought about by a defective gastro-intestinal tract. There may be defective utilization of the vitamin.⁽²³⁾

Methods of Assay.

The amount of thiamin can be determined only with an approximate degree of precision.⁽²⁴⁾ A simple diagnostic test for thiamin deficiency has not yet been evolved.

Distribution of Thiamin in Food.

The majority of plant and animal tissues which are used as food contain about one-half part of thiamin to every million parts. The richer foods contain only three to five parts per million. The germ and bran coats of grains may contain 30 to 50 parts per million.⁽²⁵⁾ Wheat bread has been the staple cereal food of the English people since the latter part of the eighteenth century.⁽²⁶⁾ About 1870 the modern roller mill process for milling wheat was introduced into England. The roller process makes possible the manufacture of a flour which consists entirely of starchy endosperm with its finely crushed proteins. Not only is ordinary white flour (73% extraction) poorer than wholemeal flour in vitamin B₁, but it also has a lower content of B₂ vitamins, minerals and protein.⁽²⁷⁾ An important incentive for the manufacture of white flour is its improved keeping quality. Insects which infest grains tend to deposit their eggs in the germ,⁽¹¹⁾ which is the best part of the seed from the nutritional standpoint. For seventy years white flour has signified flour from which both germ and bran have been removed.

It has been estimated that a diet given to the parish poor in England in 1782 contained 660 to 850 international units of vitamin B₁ per day. The poor law diet given in the City of London in 1838 contained 1,060 international units per day.⁽²⁸⁾ In or about the year 1936 the diets of 1,152 families at six different income levels were analysed for vitamin B₁. It was found that the daily vitamin B₁ intake ranged from about 290 units at the lowest income level to 450 to 550 at the two highest income levels. Thus the best fed members of the population today, while receiving twice as much vitamin B₁ as people on a low income level, yet consume less of it than the parish poor of the eighteenth and early nineteenth centuries.⁽²⁹⁾

The vitamin B₁ requirement today is probably greater than it was a century ago, since there has been a pronounced rise in the consumption of sugar. Refined sugar brings nothing to the vitamin B₁ content of the diet, but adds to its carbohydrate content and therefore to the need for the vitamin. In western countries the average consumption of sugar has increased from a few pounds per person per year a little over a century ago to upwards of 100 pounds per person today.⁽³¹⁾ This consumption is not uniform as regards individuals. The countries with the highest average annual consumption per head of population are Denmark, New Zealand, Great Britain, Australia, the United States of America and Sweden.^{(31) (32)} The price of sugar has fallen to such an extent in the past fifty years that, instead of being a luxury for the few, sugar has come to be considered a necessity of life by even the poorest classes in industrialized countries.⁽³³⁾ The vitamin B₁ requirement of the poorer people who habitually eat carbohydrate-rich diets is greater than it would be if their diet were more varied. The vitamin B₁ content of most foodstuffs is not very high, so that it is difficult to select a diet of average cost which provides an optimal amount of vitamin, if the bread and flour eaten are devoid of it. In a recent issue of *The Journal of the American Medical Association*,⁽³²⁾ the following editorial comment was made:

When white flour and sugar provide fifty per cent of the calories, as is the case in England and America, selection of a diet that can be called good in the sense that it satisfies more than minimal requirements for vitamin B₁ and calcium, is almost impossible except for an expert.

Evidence of Deficient Intake of Vitamin B₁.

If Cowgill's estimate of the minimum daily requirement of vitamin B₁ (300 to 350 international units) is considered in conjunction with Lloyd's finding, that the daily vitamin B₁ intake at the lowest income level is 290 international units,⁽²⁵⁾ it would appear that evidence of an inadequate intake might be found in England and among people with a similar diet. Many observers have recently expressed the opinion that certain pathological conditions found in western countries are wholly or partly due to hypovitaminosis B₁.^{(19) (20) (30) (34)} These conditions include polyneuritis, especially when associated with alcoholism or pregnancy, cardio-vascular dysfunction^{(31) (32) (35)} and gastro-intestinal disorders.⁽³⁶⁾ Minot⁽³⁷⁾ considers that "the

occurrence of a mild state of sub-optimal nutrition, or a border line state of partial deficiency is very common". In England, Harris, Leong and Ungley⁽³⁴⁾ found a low value for the vitamin B_1 reserve in several medical cases, and they are of the opinion that a condition of multiple vitamin deficiency is not infrequently associated with the poor nutrition characteristic of so many diseased states. It has been found that the addition of vitamin B to the diet of apparently normal as well as to that of malnourished children increases the appetite, general well-being and rate of growth.⁽³⁵⁾⁻⁽⁴⁰⁾ Fantus⁽⁴¹⁾ states that dry beriberi occurs in all economic classes in Chicago. Strauss is of the opinion that "during the past decade beriberi has been endemic in the United States in characteristic form".⁽⁴²⁾

Hypovitaminosis B_1 and Poliomyelitis.

A deficiency of vitamin B_1 is the principal aetiological factor in the causation of beriberi.⁽³⁰⁾⁻⁽⁴⁰⁾ There are points of resemblance between beriberi and poliomyelitis.⁽⁴⁷⁾⁻⁽⁴⁹⁾ These conditions appear to have similar seasonal incidence, sex incidence and predisposing causes. Both may affect almost any part of the nervous system. In both the most common and characteristic symptom is flaccid paralysis of the leg muscles. These analogous features will now be considered in greater detail.

In the northern hemisphere beriberi, like poliomyelitis, has its maximum incidence about August and September.⁽⁵⁰⁾ In Japan every year during the months of July, August and September there is an increase of this disease.⁽⁵¹⁾ If epidemics in male institutions, such as prisons and military camps, are left out of account, the incidence of beriberi is almost always higher in males than females. In 12,619 cases in northern Circars, Madras, there were 8,692 males and 3,927 females.⁽⁵²⁾ In an epidemic which occurred amongst the general population in Rio de Janeiro between October, 1932, and July, 1933, 307 males and 127 females were affected.⁽⁵³⁾ Cowgill considers that beriberi is more common in males than in females.⁽⁵⁴⁾ He gives as the explanation of this the fact that males have a distinctly higher rate of metabolism than females, are usually heavier and more active and consume greater quantities of food. They therefore need a larger amount of vitamin B_1 and are more apt to develop symptoms of beriberi when the vitamin content of the diet is low. Recent work suggests that there may be a fundamental difference in the carbohydrate metabolism of the sexes.⁽⁵⁴⁾⁻⁽⁵⁷⁾ Of 174 persons suffering from beriberi in Newfoundland and Labrador, 80% were males and 20% females.⁽⁵⁸⁾ Of 876 persons suffering from beriberi who attended the out-patient department of a Japanese hospital in 1921, 527 were males and 349 females.⁽⁵⁹⁾ The excess of males over females has been described as one of the most constant features of poliomyelitis.⁽⁶⁰⁾

It has been noted by many observers that muscular exertion contributes to the development of beriberi⁽⁶⁰⁾ and of vitamin B_1 deficiency⁽⁶¹⁾ and to the increase of pyruvate in the blood.⁽⁶²⁾⁻⁽⁶⁴⁾ There is a growing weight of evidence that muscular exertion is also a predisposing cause of paralytic poliomyelitis. Leake⁽⁶⁵⁾ made the following statement:

A history of over-exertion preceding an attack has often been noted in cases of poliomyelitis. That this may be an important hint for prevention is suggested in the Los Angeles epidemic by the fact that, with comparable control individuals, such a history was obtained less frequently than with individuals attacked by the disease.

In a report of the 1931-1932 epidemic of poliomyelitis in New South Wales⁽⁶⁶⁾ the following statement appears: "It has been noted in Australia that exhausting exercise has immediately preceded the onset of the disease in several patients who have developed severe and widespread paralysis." De Rudder and Petersen⁽⁶⁷⁾ consider that muscular exertion may have been a predisposing cause of infection in an epidemic in a school in South Germany. In an epidemic in Essex in 1939 it was found that those muscles exercised most in the initial stage seemed to suffer most from paralysis.⁽⁶⁸⁾ Bull in her report of the 1937-1938 epidemic in Melbourne made the following statement: "Frequently the parents gave me a history of unusual

exertion, or volunteered the observation that the patient was the most physically active member of the family."⁽⁶⁹⁾ The following histories are of patients who were not at rest during the preparalytic stage of the disease. Paralysis ensued. The outcome of the illness in these cases is in great contrast with that of the majority of children admitted to hospital during the first four days of the disease and given rest in bed. In the 1937-1938 epidemic, at the Royal Alexandra Hospital for Children 87% of such children escaped without paralysis.⁽⁶⁹⁾

A.D. was a male patient, aged thirteen years. On December 28 he complained of a "sick feeling in the stomach", slight stiffness of the neck and pain in the lower part of the back. On December 29 he was constipated, but felt better and was walking about most of the day. He had a headache and was restless and irritable at night. On December 30 he was listless and irritable and had a headache and lower backache; there was rigidity of the neck, and he could not bend his head forward. He walked about, but found that he could not take long steps. On December 31 his condition had improved, but he slept most of the day. He was allowed to get out of bed. On January 1 he had headache, anorexia and pain in and rigidity of the back; his legs were weak and constipation persisted. He was unable to pass urine. On January 2 rapid spread of paralysis was noted and on January 3 the boy died.

T.D., a male patient, was aged eleven years. On December 21 he suffered from malaise and on December 22 he was feverish and had pain in the back of the neck and anorexia. On December 23 he felt well; he went to a picnic and won a race. On December 24 he had a headache and his temperature was 103° F. He had severe pain in the back between the shoulders, which spread to the lumbar region. He was very constipated. On December 26 he seemed better, but had great difficulty in walking. On December 27 definite paralysis of the right leg was present. Six months later he still had pronounced weakness of the right leg and foot and slight weakness of the right thigh muscles.

A.R. was a male patient, aged four years. On February 18 he suffered from malaise and on February 19 he was irritable and feverish. On February 20 he was not quite well, but was better than on the last two days. On February 21 he went out, but his legs seemed to be weak. On February 22 he was in bed and on February 23 he was weak and walked only with difficulty. Seven months later the muscles of both legs and feet were still very weak. He had not walked.

Pregnancy and lactation appear to favour the development of beriberi⁽¹⁹⁾⁽⁵⁰⁾ and of hypovitaminosis B_1 .⁽¹⁷⁾⁽²⁴⁾⁽⁶⁷⁾ In India the incidence of beriberi was found to be higher among males than females at all ages except between fifteen and twenty years. In most cases in women the ailment was subsequent to the first childbirth.⁽⁶⁸⁾ Much evidence has accumulated to show that hypovitaminosis B_1 is the cause of polyneuritis of pregnancy.⁽¹¹⁾⁽⁴⁶⁾⁽⁷⁰⁾⁽⁷¹⁾⁽⁷²⁾ Lowered reserves of vitamin B_1 have been found in pregnancy.⁽⁷³⁾⁽⁷⁴⁾ Animal experiments have shown clearly that more vitamin B_1 is needed in pregnancy.⁽¹³⁾ An eminent authority, W. Lloyd Aycock, encountered ten cases of poliomyelitis during late pregnancy in two years, and has given it as his opinion that this is out of proportion to what would normally have been expected if the condition had not predisposed the patients to the disease.⁽⁷⁵⁾⁽⁷⁶⁾ In the 1937-1938 epidemic of poliomyelitis in New South Wales 28 females between the ages of fifteen and thirty-five years were infected.⁽⁷⁸⁾ Seven of these women (or one in four) were in the later months of pregnancy or were lactating. Statistics⁽⁷⁷⁾⁽⁷⁸⁾ show that in New South Wales approximately one in ten women between the ages of fifteen and thirty-five years was confined during 1938. No conclusion can be drawn from such small numbers. Further information on the frequency of poliomyelitis during pregnancy and lactation should be collected. It is probable that many cases occur and are not reported.

Many authorities on the pathology of beriberi consider that it affects the whole nervous system.⁽⁷⁹⁾⁽⁸⁰⁾⁽⁸¹⁾⁽⁸²⁾ Shattuck⁽⁸³⁾ raises the question whether the neuropathy of beriberi should be described as peripheral, and points out that Vedder⁽⁷⁹⁾ considers that pathological changes are demonstrable in nearly all parts of the central nervous system, and in the sympathetic ganglia as well. Poliomyelitis has been described by Hurst⁽⁸⁴⁾ as a disease of the whole nervous system, including the intervertebral

ganglia and peripheral nerves, although the brunt of the virus attack is borne by the anterior horn cells of the spinal cord, which must be specially susceptible to the action of the virus. In a description⁽⁸⁴⁾ of the microscopic appearances of material from 96 post-mortem examinations appears the following statement:

The lesions are by no means restricted to the anterior horns, however, and in the more severe cases we find extensive involvement of the posterior horns, of the lateral columns of Clarke and even of the white matter of the cord and brain stem. . . . We find extension of the inflammatory process to the nerve roots and in the regional ganglia. Histologic studies of the nerves, such as the phrenic, may show extensive demyelination with degenerative changes.

In both poliomyelitis⁽⁸⁵⁾ and beriberi⁽¹³⁰⁾⁽⁸⁶⁾ the most common and characteristic symptom is flaccid paralysis of the leg muscles. Muscle tenderness is characteristic of both diseases.

The condition known as Landry's paralysis has often been associated with, and confused with, poliomyelitis.⁽⁸⁶⁾ Brown⁽⁸⁷⁾ and Shattuck⁽⁸⁸⁾ have thrown a new light on this condition. There seem to be good grounds for their belief that the original case described by Landry was one of beriberi. The absence of pathological changes on microscopic examination of the cord, which is held to be characteristic of Landry's paralysis,⁽⁸⁹⁾ could be readily explained by a hypovitaminosis B_1 of severe degree and short duration.

In the United States of America reports of many epidemics of anterior poliomyelitis reveal a lower incidence in the Negro population than in the white population.⁽⁹²⁾ In New York City in 1907 there were only two cases among Negroes out of a total of 752 cases. In the New York City epidemic of 1916 the morbidity rate was lower among Negroes than among white persons. In New York City in 1931 the attack rate for the white population was two and a half times greater than that for the Negro population. In the Detroit epidemic of 1924 only five Negroes were affected in 300 cases, although Negroes comprised about one-twelfth of the city's population. In Texarkana in 1913, 19 Negroes and 124 white persons developed the disease. In Texas in the 1927 outbreak there were 58 cases, all among the white population.⁽⁹³⁾

Cowgill has made the following statement: "Search of the medical literature reveals that . . . beri beri is practically unknown among the poor negroes of Alabama and Virginia."⁽⁹⁴⁾ The diets of southern Negro families have been found to contain a relatively large amount of vitamin B_1 ,⁽¹³⁷⁾⁽¹³⁸⁾⁽⁹⁰⁾ owing to the fact that they consume large quantities of whole corn meal, sweet potatoes and pork.

It has been observed in several epidemics which have occurred in recent years, that poliomyelitis has been more frequent among poor people than among the rich. In a report⁽⁹¹⁾ describing the 1931-1932 epidemic in Sydney appears the following statement:

It was noticeable that a large majority of the patients (approximately 93%) were sent to public hospitals for treatment. Many came from families which had been in receipt of financial help from the State owing to unemployment.

In Ontario,⁽⁹⁵⁾ "poliomyelitis has been found to occur with somewhat disproportionate frequency in over-crowded homes of lower-than-average economic status". In Melbourne, in 1937, "the inner suburbs containing a large proportion of people living under conditions of over-crowding and economic stress had the highest incidence".⁽⁹⁶⁾ In Essex, in 1939, "a high incidence was noticed amongst the unemployed" in the Tendring rural district.⁽⁹⁷⁾ The tendency for the poorer people to be attacked has been ascribed to the greater difficulty in isolating the patient who lives under crowded conditions. Experience has shown, however, that lack of isolation in hospitals and other institutions does not appear to increase the spread of the disease,⁽⁹⁸⁾ and there is evidence in favour of the conclusion arrived at in the following statement:

The high number, not only of subclinical cases, but also of germ carriers in epidemic times renders extremely doubtful the efficacy of the usual quarantine measures, both

for patients treated in hospitals or at home and for infected communities. These measures are bound to fail unless they are so vigorously applied as to stop completely all social life.⁽⁹⁹⁾

In view of the apparent ineffectiveness of isolation, as ordinarily practised, it is at least as likely that the greater prevalence of poliomyelitis amongst the poor is due, not to the absence of such isolation, but to an inadequate intake of vitamin B_1 .

The B_1 content of most foodstuffs is not very high so that it is very difficult to select a diet of average cost which provides an optimal amount of this vitamin if the bread and flour eaten are devoid of it.⁽¹⁰⁰⁾

Poliomyelitis did not become prevalent in Germany during the war of 1914-1918.⁽⁹⁴⁾ This has been taken as an indication that lack of nourishment does not predispose to poliomyelitis. Cowgill states that beriberi did not occur in Germany during the period mentioned, in spite of a serious food shortage.⁽¹⁰¹⁾ He points out that the caloric content of the diet was low, and that much of the slightly milled cereals was used. According to his estimate the vitamin/Calorie ratio was greater than the absolute minimum which would have produced beriberi.

The incidence of poliomyelitis in countries where beriberi is endemic is not known with any accuracy, because in most of these countries there are either no statistics or very sketchy records.⁽⁹⁹⁾ It has been stated that in Japan poliomyelitis has a relatively high incidence and causes several hundreds of deaths every year.⁽¹⁰²⁾ Huffmann pointed out that both poliomyelitis and beriberi have appeared to be more prevalent in Norway and Sweden since 1887.⁽¹⁰³⁾

The incidence of poliomyelitis is generally highest in the summer towards the end of the school holidays. The vitamin B_1 reserve of children at this period must often be at a low level. Their metabolism has, in many instances, been increased by an excessive amount of exercise as well as by growth.⁽¹⁰⁴⁾⁽¹⁰⁵⁾⁽⁹⁷⁾

The roller mill process of milling wheat was introduced into England about 1870,⁽¹⁰⁶⁾ and into Connecticut in 1874;⁽¹³⁷⁾ it caused a decrease in the vitamin B_1 intake. The consumption of sugar in most western countries has increased in the last hundred years, particularly in the last fifty years.⁽¹³¹⁾ Romer, in his monograph on epidemic infantile paralysis, published in 1911, makes the following comments:

After the appearance of Heine's monographs (1840 and 1860), and at a time when the literature of the disease was becoming extensive, no mention was made of any epidemic before 1880 . . . But when the symptomatology of the commonest type of the disease had been fully described under the name of spinal "infantile paralysis", the absence of reports of epidemics can be explained only by the fact that such epidemics did not occur before 1880 . . . It is most remarkable that a disease, which had been well known in its sporadic form for many years, should attack groups of cases in 1880 and onwards, and should appear in epidemic form [referring to the first large epidemic] first in 1905.⁽¹⁰⁷⁾

Is the increase in number and size of epidemics since 1880 related to the change which has taken place during that time in diet—the lowered intake of vitamin B_1 and the increased intake of refined carbohydrate?

Although the virus of acute anterior poliomyelitis resists the action of phenol and many other antiseptics, it is readily destroyed by oxidizing agents.⁽¹⁰⁸⁾⁽⁹⁹⁾ Flexner and Lewis⁽¹⁰⁹⁾ found that the virus was quickly destroyed by a 1% solution of hydrogen peroxide. A 2% solution of potassium permanganate with equal parts of virulent emulsion destroyed the virus after one hour's incubation at 37° C.⁽¹¹⁰⁾ "The oxygen consumption per unit mass is about thirty times as rapid for grey matter as for muscle or peripheral nerves, and it is qualitatively almost restricted to carbohydrates and their intermediates or substrata."⁽¹¹¹⁾ Tissue respiration has been defined as "the utilisation of molecular oxygen for the oxidation of organic substances in tissues. . . ." "The real function of respired oxygen is to keep the tissue cytochrome in an oxidised state. . . ." "Lack of vitamin B_1 causes a diminished rate of respiration. It is suggested that neurones may be better able to resist the attack of the virus when the

vitamin B₁ intake, absorption and utilization have been adequate, and may be more vulnerable when these have been suboptimal, especially when the demand for the vitamin is increased, for example, by fever. The virus may be able to multiply only in neurones which are suffering from defective respiration. This would account for the tendency of the virus to die out at any stage of the disease. In cases of moderate lack of vitamin B₁, there may be no clear-cut symptoms.^{(119) (120) (121)} "The subtle effects produced by long standing slight nutrition defects need evaluation . . . the undesirable effect of a faulty diet in the zone of partial deficiency may become detectable only after years or generations."⁽¹²²⁾

The relationship between vitamin B₁ and the glands of internal secretion is not yet clear, but it appears to be a very close one.⁽¹²³⁾ Pronounced hypertrophy of the adrenals is a characteristic finding in experimental vitamin B₁ deficiency.⁽¹²⁴⁾ The thymus, pituitary, thyroid and liver are atrophic. Several authors have considered that persons who have an abnormality of the endocrine system are specially susceptible to poliomyelitis.^{(125) (126)}

The vitamin B₁ complex includes: (i) riboflavin, (ii) nicotinic acid, (iii) vitamin B₆ and (iv) substances grouped under the name filtrate factor.⁽¹²⁷⁾ Riboflavin is required for the production of an important oxidative enzyme involved in cell respiration.^{(128) (129)} Elvehjem suggests that nicotinic acid is probably essential in one of the enzymes that transfer oxygen from the blood to the cells.⁽¹³¹⁾ The function of other constituents of the vitamin B complex is not yet fully understood.

Treatment.

If the hypothesis that deficiency of the vitamin B complex is a predisposing cause of poliomyelitis is substantiated, it is probable that great benefit will result from the use of vitamin B as a prophylactic measure before infection has occurred. A well-balanced diet containing adequate amounts of all the vitamins should be given. A diet deficient in one factor is usually deficient in others, and vitamin deficiency states are almost always multiple.⁽¹³⁰⁾ Platt and Lu consider that vitamins B₁ and C may be involved in beriberi, and that the degree of vitamin A deficiency materially modifies the course of the disease.⁽¹³⁷⁾ There is some evidence which shows that an increased amount of other vitamins is used when the diet is deficient in one of them.⁽¹³⁸⁾

Vitamin B₁ has been given in the acute stage of the disease in two series of cases. Thirty-five patients were given ten injections of 10 milligrammes each. No decision could be reached as to whether this treatment had or had not been efficacious.⁽¹³⁹⁾ In another group of five cases, the conclusion at which the author arrived was that vitamin B therapy in acute cases of poliomyelitis resulted in rapid recoveries, with freedom from or rapid regression from paralysis;⁽¹⁴⁰⁾ but in over 70% of cases in which diagnosis is made in the pre-paralytic stage of the disease, recovery without paralysis occurs;^{(141) (142)} and in a large number of cases paralysis regresses and normal muscle power is regained within a few weeks, without any treatment other than rest in bed with protection for affected muscles.

When poliomyelitis is prevalent it seems that children and young adults should be prevented from having exhausting exercise and physical over-exertion to the point of fatigue. Children who develop a febrile illness should be kept at rest in bed at least three days after the temperature is normal and they appear to be perfectly well. The importance of rest has been stressed by many observers.⁽¹⁴³⁾

Summary and Conclusions.

1. The functions of vitamin B₁ and of riboflavin are concerned with tissue respiration. The function of nicotinic acid may also be concerned with tissue respiration.
2. Man's intake of vitamin B₁ has been substantially reduced since the introduction about 1870 of the modern method of milling wheat.
3. The incidence of acute anterior poliomyelitis appears to have increased since 1880.

4. Indirect evidence is given in support of the hypothesis that hypovitaminosis B is a predisposing cause of poliomyelitis.

5. Poliomyelitis is inclined to occur with greater frequency when the demands for vitamin B₁ are great, as in childhood and pregnancy and after excessive muscular exercise, or when the intake is low, as in poverty.

6. There are points of resemblance between poliomyelitis and beriberi. A deficiency of vitamin B₁ is known to be the principal factor in the causation of beriberi.

7. Direct evidence as to the validity of the hypothesis would probably result from the discovery of tests for hypovitaminosis B₁, riboflavin and nicotinic acid, suitable for routine use.

8. The vitamin nutrition of patients suffering from poliomyelitis should be investigated. The investigation should include the intake of the vitamin B complex, and conditions which increase the need for the vitamin or interfere with its absorption. In adults an inquiry should be made into the amount of alcohol and narcotics⁽¹⁴⁴⁾ taken.

9. The presence of neutralizing substances in the blood possibly lessens the likelihood of the development of the paralytic form of the disease, but does not appear to be a potent factor.^{(13) (4) (135)}

10. It is suggested that the explanation of the low incidence of paralytic poliomyelitis among those exposed to the disease may be that paralytic poliomyelitis occurs only when the biochemical state of the central nervous system is such as to favour the propagation of the virus. It is further suggested that hypovitaminosis B may be one cause of such a biochemical state.

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THE PSYCHOLOGY OF WAR.

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TODAY mankind is beset with a plethora of problems. They exist in such a bewildering variety that the wise man is awed and the plain man admits his confusion. One of our main difficulties is that we are facing diverse entities on differing emotional planes. To understand them aright we require not merely the emotional enthusiasm of a devotee, but also the emotional detachment of a scientist. In other words, their appreciation needs a degree of dexterity akin to that of a rope-walking juggler. The difficulty in acquiring the art is the reason for the following analysis of the emotional factors in the psychology of war.

¹ Read at a meeting of the Queensland Branch of the British Medical Association on May 17, 1941, at Toowoomba.

The main thesis may be grasped if problem and emotional tempo are placed in opposing columns:

- | | |
|--|---|
| 1. Peace of yesterday. | Complacency. |
| 2. (a) Drive to victory, incorporating the | Grim determination and hate. |
| (b) Peace plan. | Detachment and overriding sentiment ("O.R.S."). |
| 3. Peace of tomorrow. | Disciplined enthusiasm and overriding sentiment ("O.R.S."). |

Peace of Yesterday: Emotional Tempo, Complacency.

There's but the twinkling of a star
Between a man of peace and war.

When Samuel Butler some 300 years ago wrote these lines he may have been correct, but they certainly are no longer applicable. In the spacious days of yesterday, battles were fought according to rule, tradition and restricted fields; modern battles are fought on total lines and far-flung fields. The new key word is ruthlessness, nothing is sacred and the guiding rule is surprise. None the less, there are still people who regard war in the Butlerian manner and think that all that is necessary for defence is the quick fusion of recruits, uniforms and rifles into an army. While such opinions are hopelessly futile in the material sense, they are equally wrong from the psychological viewpoint.

This latter aspect is worthy of our closest attention. The essential difference between peace and war is that whereas in peace every effort is made to produce stability, in war the primary and ceaseless urge is to overthrow it. In times of peace we plan for a secure job, secure tenancy of a home, safe returns for capital, a protected old age and invalidity. We, in fact, spend almost the whole time in digging ourselves into an agreeable rut. Our ability to do this is the measure of our success. If we have a "safe job", a few insurance policies and a little property we join the envied ranks of "the comfortably off". To achieve this diadem of successful respectability, the psychological factors in our make-up have from infancy been moulded into well-ordered channels. There has been a ceaseless watering of the roots of conditioned habits, so that we "walk out with a young lady", marry, settle down and accustom ourselves to a business, professional or agricultural life in a circumscribed and conventional channel. From year's end to year's end, we can tell with exactitude what will be our task a week, a month or even a year hence.

Even our sentiments are marshalled in the same orderly manner; from the cradle, we learn of the sanctity of religion, law, property, parliament, our constitution, our nation and the national life. A convenient analogy is the electric clock, which goes for ever, or at least until the ceasing of its life current ushers in the death of time.

Long ago the brave Greeks created the conception of a "persona", a mask which fitted perfectly the face of the wearer. Our personality is regarded as just such a mask. It conforms to the persona of habit, sentiment and tradition. To this end, we have strenuously used every psychological factor and artifice. Our life is built on a scheme which enthrones as major virtues seniority, vested interest and conformation to herd ideals.

Our psychic life is divisible into three compartments: cognition or thinking, affect or feeling, conation or action. All are impressed into the comfortable life, and success is measured by the skill with which we can do a little artful but seemingly juggling in the restricted confine which the herd allows as our stamping ground.

And so, as John Doe enters the recruiting office, we see the Doe personality, moulded, burnished and tested on the peace machines. His outlook is circumscribed. Within his conscience or super-ego there is an insistent and ever-present refrain. "Life runs according to rules and traditions; its aim is security." As John Doe leaves the room, though he may not know it, he enters into the possession of a new personality. But it is not the twinkling of a star; it is a life so completely different from the old life that it might be that of another planet.

The Drive to Victory: Emotional Tempo, Grim Determination and Hate.

John Doe is now face to face with the life of war and all that it entails. He is dedicated to the drive to victory. All previous standards are completely obliterated. War has no standards or morality, no belief in the sanctity of law, property, religion, or person. His aim must be, not that of security, but that of destruction. There is no sheltered environment which man works ceaselessly to consolidate. Instead there is a ruthless enemy, who by lies, bullets, bombs, shells and torpedoes is trying by every ounce of his effort to annihilate not merely his own security but that of every man, woman and child in his nation. From civilization John Doe has passed, within the second which it took to sign on the dotted line, into the primitive existence of the jungle. With every move he is in danger of the snapping jaw and the poisoned fang. His security can be purchased only at the price of incessant vigilance and the exercise of an equal ruthlessness. The comfortable persona which served him so well in times of peace has become a millstone round his neck; if he fails to discard it, he will inevitably be led into destruction.

These words have not been penned in a moment of jingoistic sentimentality; they were written in moments of cold meditation by one who has seen war at first hand. They are words of realism.

Our problem is both urgent and pressing. Whether we are dealing with officers or men, the Australian Imperial Force, the Australian Army Medical Corps, the Royal Australian Air Force or the Royal Australian Navy, our problem is that of finding the best method of changing the peace persona into the war or jungle persona. Upon our ability to do this will depend the certainty of victory.

Before outlining some of the psychological principles which must underlie all successful war effort, I must make it clear that no carping criticism of our present *modus operandi* is intended. It may be that some of our present methods fall within the ambit of the proposals. Even so, the need for their continued observation justifies repetition.

Plutarch tells the story of Lamarchus, who chid a captain for a fault, using the words: "Sir! In war there is no room for a second miscarriage."

This story reminds us of the need for efficiency as the only criterion for continued leadership. Promotion must be based on the well-worn but very realistic principle that only those who have "delivered the goods" are fit to "deliver more goods". This dictum is, however, but half truth. The chief peculiarity of war as against a peace routine lies in the spate of changing circumstances. A serviceable manœuvre today may be obsolete and useless tomorrow. The enemy is cunning; he has new tricks and new methods. The ideal officer must have a mind of extraordinary plasticity. His cognitive faculties must permit him to think out a wide variety of possible situations, his courage and emotional tenacity must be commensurate, his powers of action require the resources of ultra-virility. It is a simple scientific problem to decide in which age groups will be found these desiderata.

Experience of the past is at a discount; knowledge of the present, the capacity to change, are the supreme needs. Such qualities are found only in the comparatively young. Seniority and maturity, which find their supreme utility in peace, are handicaps in war. Age, the crystallizer of thought, automatically reduces the capacity for change. It is the ability to change and be changed which distinguishes the brilliant soldier of today. This is a young man's war. The grey beards who see youth at the helm must accept the extinguishing of their star with a philosophy made more easy by the realization that with victory the cycle again alters and the call for civic wisdom will return.

The necessity of training for change does not involve only the officers. It involves even the most junior rating of every arm. The old adage, "today a rooster, tomorrow a feather duster", is universally true. Modern warfare is cataclysmic. A camp, a palace, a factory today, may be a mass of rubble tomorrow. New situations may arise at

any moment. There is need, therefore, for less of the old-fashioned drill parade and more of numerous manœuvres which include every calamity which may arise from land, sea or air. The multiplicity of weapons calls for the constant repetition of methods to minimize the enemy's attack and to master their use in our own offensive. There is only one psychological method of doing this—it is by use of the conditioned habit and facilitation. Constant practice for every eventuality forms a mental template which will allow swift and almost automatic repetition.

The Conquest of Fear.

Our scientists have added to war a new psychological factor. They have devised a plethora of fear-provoking weapons. Every sense is bombarded through thought-devastating and terrifying channels. Only those who have seen at first hand the awesome spectacle of panic-stricken troops infected by fear can realize the reality of lost morale. How to combat this is the first objective of every officer who leads recruits and untried soldiers to their first battle. The training, if it is to be successful, must begin before the battlefield is reached. Far more is needed than the parade discipline of pre-war days.

If we analyse fear, one of the most powerful levers in its education is terror inspired by the unknown. Awareness bombarded by the strange and dangerous registers the emotion of fear. When we are thoroughly cognizant of the surroundings, understand the way out from the dilemma, and have embarked on an appropriate action, fear disappears entirely or may be sublimated into a cool and calculating rage which enables nonentities to become heroes.

Years ago I had an extremely illustrative experience. I found myself at night alone and completely lost in the African bush; lions were in the vicinity. Terror gripped me.

The waters lapped, the night wind blew,
Full-armed the Fear was born and grew,
And we were flying ere we knew
From panic in the night.

But terror vanished when there appeared a small black boy, whose only material aid for safety lay in his knowledge of the road to his home.

To revert to our theme: soldiers must be taught by constant practice the speedy action against every possible emergency. They must learn to observe, to make quick dispositions towards attack and safety.

At this stage let me introduce to you a remarkable little book entitled "The Soldier in Battle", by Captain G. D. Mitchell. It is a small psychological treatise written in plain English by a soldier of the last Great War. It is so succinct and helpful that I consider that a copy, initialled by the General Officer Commanding, should be given to every recruit, and to ensure its being read, he should have lectures on the contents and should have to pass a formal examination on it. Captain Mitchell not merely inspires us to courage and victory; he points out the right route to the elimination of fear.

Let me quote a brief passage:

It was found that when each man was told fully what his role would be, he would play his part regardless of danger. He set his course for the ultimate goal with a clear mind.

The first results of this distribution of intentions and knowledge to all ranks were great tactical successes. But more than this, the effect on the psychology of the individual soldier of this fore-knowledge was far-reaching.

In civil life an employer does not consider it beneath his dignity to discuss certain aspects of his business with his employee. The successful employer leads rather than drives his employees. He welcomes suggestions for the improved working of his business, and is ready to adopt suggestions that are of any value. Successful military and successful business methods are not essentially different.

It was not only wise, but necessary to tell the Digger all one knew. If an attack was expected, he was told when and where it was expected, and that he must stop it. He did stop it.

Not the least of the many intriguing things within the cover of this handbook is the insistence on practising every

possible method of defence and offence. Every type of enemy gun and weapon must be handled and used in order to prepare for the time when they may be required for our foes. The platoon commander must be an aerial map reader; varying bullet noises must be remembered; even habits of non-smoking are useful in order to aid the speedy detection of gas.

Fear leads to a momentary paralysis of all activities. It can be averted only by the constant training in quick action. The famous two-gun men of the western tales practised for hours at the draw before they could consider themselves adept at the art of self-defence. In warfare such practice is not merely desirable but essential. Let me again quote Mitchell:

A bunch of V.C. winners gathered together for investiture, were discussing battle. One summed up what they had learned as follows: "If you hop straight into him [the enemy] he just folds up." This is the theory of turning the period of enemy indecision (or paralysis) to good account. Good troops should not have this fault, but it can show up in any emergency. The period may not last more than four seconds, but that is three and a half seconds too long.

Or, again:

I picked out the officer and jammed my pistol into his Adam's apple, still obsessed by the rage that drives out all fear. His men waited for a command and that the officer was too frightened to give. It must have been a humorous sight. When he found his voice he told them something, and they surrendered like lambs. Why? because they had been held by the order to halt, and when their time of paralysed indecision had passed the show was over. . . . Train each man to sleep with his rifle in a known position beside him so that he can wake and fight in the action, for seconds, sometimes, are more important than whole years.

Preach and train for instantaneous action in any emergency. Only by that means will you destroy the time-lag, battle paralysis.

The following extract from a letter written by a gunner in one of our fighting aeroplanes of this war illustrates not merely how anxiety is followed by calm and collected fighting but is heightened by a sense of superiority in face of the enemy.

"Two more enemy aircraft on the Port Beam!" "Phew! things is tough!" says I to myself, says I—and just to cap things the tail gunner sighted a fifth Jerry off our Starboard quarter. If you think I was scared stiff you are dead right!

It is funny, but after the first feeling of anxiety I actually found myself looking forward to getting a Hun in my sights. It was more thrilling than frightening, especially as we knew that Sunderlands are held in high respect by the Fritzies.

As already indicated, fear tends to vanish when the life forces are mobilized into effective action. One is frightened at a snake but the emotion vanishes when, armed with a length of fencing wire, we move to turn the table on our opponent. In this action we have introduced another psychological entity, that of motivation. We have the urge, the belief, the feeling to kill an obnoxious reptile. We have also the urge to rid the earth of other noxious vermin and to create a verminless world!

This illustration though crude portrays a universal truth. We work and slave from dawn to dusk not for the fun of working but for a long distance objective, the welfare of our children, security in old age, glory, the good opinion of our neighbours, the salvation of our soul, etc. Though the goal be different in various individuals, each is determined by a motive. The principle is equally true in warfare. Victory is rarely achieved by those who lack adequate motives to victory. It is not sufficient to have a vague academic belief in the justice of one's cause—there must be a burning belief in invincibility and righteousness of objective. These must be moving, soul inspiring, and dynamic. Let me repeat again that peace and war are as apart as the poles. Whereas in peace we love our enemy, in war every enemy symbolises potential death to ourselves and our friends.

To refer again to Mitchell:

Shoot to kill. If you do not, tomorrow morning some of these men will sit behind fresh machine guns. Their bullets will flay your ranks, kill good soldiers, perhaps kill you. Remember that only a dead or captured enemy can do you no further harm. I have seen futile pity weaken our hands. As an enemy party breaks away in ludicrous desperation men will say "Let the poor bastards go".

He who lets an enemy escape may be the means of death to his best friend. . . .

Let the enemy know that your coming means death to him, unless he surrenders early. This knowledge will cause him to break when attack becomes threatening. And this breaking will save half your men who would otherwise be knocked out in the close fighting.

The soldier who vacillates between humanitarianism and ruthlessness in battle should be instantly cashiered—he has not grasped the first principles of warfare. The issue is clear cut—it is victory, cost what it may! Towards this we must consider two types of motivation, both important and necessary, though at first sight they are incongruous. The one is immediate, the other distant. With regard to the former, the prime movers are the primitive but the vitalizing emotions of hate and revenge. Friends and relatives have been mutilated and killed by the ghastly weapons of the enemy. You will extract the penalty: "An eye for an eye, a tooth for a tooth." The soldier in battle does not deal with platitudinous half-truths; he pins his faith to reality and decides that:

About the most sustaining thought is to nurse your desire for revenge, to decide on all the nasty things you will do to the enemy when they come at you. Most especially these things you will do to their gunners when you get among them. You should always remember that you are a storm trooper, and that if the odds run against you today, your turn will come.

In the train of successful revenge arises the feeling of an intense superiority over the enemy. There is born a faith, not only in one's own prowess, but in that of the battalion, air squadron or unit. Our "cobbers" are invincible! The *esprit de corps* blossoms until fear of treachery or cowardice is unthinkable! The whole unit is conceived as a vast king of the jungle, master of the fiends who think to imperil its security!

Our hate is not for the nation, but, in Churchill's manner, for that evil man of Germany and that one man of Italy who against King, Pope and People "arrayed the trustees and inheritors of Ancient Rome upon the side of the ferocious pagan barbarians". The hate is for parties and not for peoples. Just why this aspect is important will soon be revealed.

So far I have discussed the victory drive as it affects the soldier. This is a total war; the goal can be achieved only if the general public also participates in coordinated war work as a result of upsurging emotions on a high plane. Our masses also need the plane of grim determination and hate in order to work day and night for the hope of salvation.

As an index of what we are actually achieving, I shall quote without comment a war talk by "J.G.H." in the front page of a daily newspaper—*The Courier Mail* (Queensland) of April 30, 1941.

It is not defeatism to look danger in the face. It is not defeatism to acknowledge that, so far, the Nazis have given us the worst in this war. It is not defeatism to say that the British Commonwealth is fighting a desperate fight. We are up against an enemy who has shrewdly exploited every weakness of the democracies, and we are still showing him weaknesses to exploit.

Here in Australia there should be work for every fit man and woman. With only 7,000,000 garrisoning this huge continent we should be working harder than 80,000,000 Japanese. Compared with them, compared with the people of Britain, we are still loafing. We have not cut out a single holiday, a single race meeting. We have wasted and are still wasting precious time in strikes.

Read these words of a refugee from conquered France: "It is a fact that for a long time our countries, rather than face a painful reality which demanded work and courage, took refuge in make-believe words. England lived for cricket and football; the United States for baseball and movies; France for local politics and literary cliques. . . . But when it is a question of saving your skin, time is too precious to permit of these mass escapes. While our children were being delightfully thrilled by the happy endings of Hollywood movies the youth of Germany was at work shaping the real world. . . . And in it the endings are harsh."

If there is not a warning for every Australian in those words, grimmer warnings may be heeded too late.

The reader is left to decide, and if he still has doubts they may be dispelled by reference to the same journal, of May 1, 1941:

Australia can offer also something vitally important—fertile land for hundreds of thousands, if not millions, of Japanese, who dislike the severity of the climate of Manchukuo and North China.

The German paper adds that England has left Australia an incredibly empty country, seductively facing Asia's over-crowded shores. After the Axis wins the war Japan naturally will be able to have its own way with Australia.

The paragraphs were noted without any hostile commentary.

The Peace Plan: Emotional Tempo, Emotional Detachment.

History shows that great victories against stupendous odds have been won through belief in a great ideal. The goal thought motivates the soldiers to heights of tremendous endeavour. It has varied through the ages, from the urge for a world Allah to the Roundhead heaven of Puritanism. Today Germany is motivated by the striking theme of living space and a world Reich. We should not belittle this aim; we should counter it with a stronger measure. The plea for safety for democracy is not enough. Few men will fight to save traditions as they will for the seizure of a new terrain. It is the distant pastures which display the greenest tint; it is the far horizon which beckons the adventurous.

In the last war we fought the "War to End War". Today we have not even this illusory signpost. We anxiously await from our leaders the message which will outline the plan of the peace which will follow victory. Bold in outline, brilliant in its broad vision, inspiring in its ideals, it will give us a scheme for future international harmony and national prosperity. Such plans are not chimerical; they exist, and it needs but the Allies' deliberation to place them upon the pedestal of world thought. Without them we are robbed of a great psychological force for victory. With it, we should not merely hearten ourselves, but place with unerring skill a spanner into the wheel of enemy propaganda.

The great columnist, Dorothy Thompson, after pleading for the union as a live federation of the English-speaking world of Britain and the Commonwealth with the United States of America, makes the following significant remark: "They cannot be British aims, for the simple reason that Britain is not strong enough to secure or enforce such a program." But although at the moment our hands in a national sense are tied, it is surely our duty as doctors to probe quietly the causes of this morbid phenomenon of mass insanity, this psychopathic state we know as war.

The existence of civilization is at stake. Truthfully and literally we must fight or perish. These words are written in the spirit of medical ethics by one who has played his part in the last war and is cheerfully trying to do likewise in this war. The physician faces death and is exposed to danger every day of his medical life. He is a professional soldier, who views his life work dispassionately. Without passion or hatred, he calmly orders his forces and searches for the cause of the epidemic or disease. We must likewise do our utmost for the successful prosecution of this war, but we shall be failing in our duty if we do not prosecute research in prophylaxis for the prevention of further wars. If war is a medical problem, we physicians must find the solution.

We Reach the Sentiments.

At this moment two enormous groups of people—we, "the Allies", and our enemy, "the Axis"—are at war. Each moves, acts, talks and thinks in unison, as though it were the gigantic extension of a single individual. Behind each army trail are millions of civilians behind the lines, who though not at war are in the war.

If we analyse this gigantic robot creation we find that the individuals are held together by psychological threads—the herd instincts, suggestion, imitation, persuasion—which reinforce a group sentiment and a group will. The sentiment embodies the idea of

nationalism and patriotism. The will is the will in the urge to survive.

The sentiments may be usefully described in two columns.

A. Allies.

Democratic ideals.
Rights to personal freedom
of speech and religion.

Refusal to be dominated.
Equality of nations.

B. Axis.

Totalitarian ideals.
The only right, to follow
the leadership of a divine
Hitler or Mussolini.
Refusal to be encircled.
A glorious German nation.
Predominance of a particular
culture.
Ideal of German culture.
The idea of German
superiority.

None of those people who have lived under our democratic freedom would doubt that the A sentiment is better than the B sentiment; but at the moment we are no more concerned with preferences than is the physician with a preference for men or women, blondes or brunettes. That is a personal matter. He must do his best for the population as a whole. He must treat humanity.

This war is not a matter of England *versus* Germany; it is a war between conflicting sentiments. It is a psychological war, fostered by organized propaganda using the herd instincts as the motive power. It is simply a war of sentiment A *versus* sentiment B.

An objection will be made to this thesis on the plea that German mentality differs from French and English or Dominion mentality. That this is not so is shown by the fact that thousands of Germans and their children domiciled in our empires are loyal supporters of the A sentiment. The difference, therefore, is not one of race, but one of ideology. Furthermore, there is the personal opinion of every doctor who has treated Germans and Allies. Fundamentally, their make-up, if not identical, shows only immaterial differences. Bring up a German baby in an English home, he will become English in his outlook, and *vice versa*.

Viewed rationally and stripped of its emotional blinkers, the problem of war prevention depends on psychological principles. It is a matter of how to coordinate conflicting sentiments. How can they be mastered and made to exist in harmony?

At this stage it is again necessary to remember that sentiment is the enemy of judgement. Emotion and reason are poor bedfellows. The surgeons and physicians who allow their decisions to be swayed by emotional side-tracks are usually failures. Our aim is to stand aloof, to see facts as they are and to give our decisions on the basis of objective reality. In this problem of war prophylaxis we must for the moment divest ourselves of patriotic national trappings and descend naked into the arena of reason. If we are unable to divorce ourselves from sentiment, then we must remain mere wavers of flags and not the leaders of human destiny. As trained thinkers, it should be easy for us to be among the leaders.

The Solution.

It is fortunate for mankind that there exists an historical literature extending over thousands of years. Wars have been as prevalent as measles. The almost invariable solution is to defeat your enemy, then punish him, garrison his country or make a pact, alliance or treaty. The very existence of this war shows the futility of the process. The result might have been anticipated, because those methods do nothing to bridge the conflict of sentiment. The vanquished find their sentiments reinforced by added hatred of the oppressive measures. The national sentiment becomes stronger and not weaker. In the course of years the sentiment becomes so virile that the tables are turned on the erstwhile victor.

The above measures may be expedients, but they are poor psychological procedures. It may be stated axiomatically that conflicting sentiments can be harnessed only by the growth of an overriding sentiment.

The gamut of individual psychology bears recognition of this fact. The sentiment to the father and mother is

superseded by the greater sentiment towards God and the nation. The sentiment towards the free and easy life of bachelorhood and spinsterhood is overridden by the new sentiment of marriage and parenthood. The sentiment of individual prowess in sport is submerged by the greater sentiment of sport efficiency for the school team, the university team, the State and interstate team. The greater overrides the smaller. As students we literally fought for our university side. As graduates we realize that our university is but one item in a greater medical whole.

The principle of the overriding sentiment finds a place in every phase of our life. We join a church, the freemasons, a regiment, an office staff, an association. Immediately our conduct towards every member of our new fraternity changes. Although we were possibly previously hostile to one of them, we do not fight him now, because he is one of us. The chains of the herd instinct have fettered our instincts as surely as if a policeman had fastened handcuffs, yet the bonds are kindly.

We are indeed in the coils of an overriding sentiment! The leader of men knows intuitively the force of the overriding sentiment. If he has a zealous but unruly member, he does not punish or browbeat him, he gives him a place on his committee, a duty in the organization, and therefore harnesses his aggressive instinct. The story of religious and political organizations echoes and reechoes the force of the overriding sentiment. It is not a rarity, but the veritable bread and butter of group psychology.

In national affairs every history book gives a spate of examples of the efficiency of the overriding sentiment as a moulder of group thought and action. Tribes become nations, nations unite, as in the case of England, Scotland and Wales to form a Greater Britain. The cantons of Switzerland, the States of North America, the great British Empire *et cetera* are milestones in the progress following this great underlying idea.

Possibly the most outstanding example is that following the Boer War. Irreconcilable elements, the Boers and the English, with differing languages, customs and religion, united to form a Union of South African States. They in fact created a new sentiment, that of a united South Africa. After thirty years it is questionable if more than a handful of the inhabitants would consider a return to the previous arrangement; though some might prefer to break away from the British Empire, they are proud of the Union of South Africa.

A consideration of the above gives the key to the solution of the prophylaxis of war. Men do not go to war with the other members of the herd if they have equal rights and opportunities. It is true that civil wars have occurred, but never when rights are equal and just. An overriding sentiment based on justice and equality is the strongest of all human interrelationships.

So far I have dealt with generalities. A strong sentiment must be based on realistic ties. History is cluttered with the relics of unions based on pie-crust promises, loose phrases and bombastic words. A union, to be worth while, must have a substratum of material benefits and transferred rights. We in Australia have a unique opportunity of understanding the nature of the sacrifice entailed. In actual fact it may be regarded, not as sacrifice, but as a mere transfer to a Federal sphere of certain State rights. We lose nothing, we gain much. We transfer: (i) our rights to citizenship, (ii) our control of tariffs and interstate trade, (iii) our monetary system, (iv) our defence, (v) our postal system.

An analysis of the Swiss, United States of America, South African and Greater Britain unions shows substantially the same transfers. It is apparent, therefore, that such bonds do conduce to an alliance in which war between the members of the alliance becomes an impossibility. The critic may question whether the transference of all these rights is essential to the stability of an overriding sentiment. I merely state a fact, that their inclusion has resulted in the desired state of harmony. The success of the arrangement suggests the wisdom of its acceptance, if not *in toto*, at least in principle.

Our Present War and the Next War.

The widespread ignorance of psychological realities is astounding. Nowhere is this more apparent than in the consideration of war. Patriotism throws a smoke screen of emotionalism through which reason must force its way with difficulty. If we are at war with sentiment, then it is obvious that we must endeavour to change the sentiment of our opponents into a more friendly mood. This can be achieved only by pointing out, not in generalities, but in hard solid propositions, that our aims will actually benefit the enemy. Any hint of oppression and vengeance will reinforce their opposing sentiments. This aim can be achieved only by our decision to fight, not for our own ideals, but for a greater ideal which will for all time form the nucleus of an overriding sentiment, combining the ideals of both A and B.

It may be said that this has already been done by our leading statesmen; but actually they have spoken in generalities. The German with memories of the last war promises and the Versailles actualities has a basis of pessimism. He must be confronted with factual statements of definite, just and friendly objectives. The reality of this need is made apparent by a critical and unemotional survey of the sentiments fostered by the peace of 1918. Humanity suffering for the sins of its forefathers has been a recurring feature through history. Seldom does right eventuate from the performance of wrong. In order to foster the German revolt from their Kaiser and his party we promised a just peace which would end all war. Doubtless this was our intention; but intentions and accomplishments are at variance unless laid upon a solid basis. We intended what we said. We allowed ourselves to be sidetracked in a maze of purely national sentiments.

Herr Hitler made the following remarks:

It was planned after the last war that we should lay down arms and trust Britain's word that the colonies were to be redistributed. The League of Nations was to be the crown of the whole plan, but the League succeeded only in sterilizing it.

With his following statement we cannot agree, for we have the solace of good intentions. But can we expect Germans to be equally broadminded?

The German people will not be cheated again. The Allies' promises in the hour of victory were all lies. Where is the much vaunted freedom of the peoples? Where are all the promised colonies? Where is the assurance of general disarmament? All lies.

Were we Germans, we might at least suspect that behind the smoke screen of self-deception there has been the fire of perfidy. As happens in the world every day, man in the mass or as an individual is judged not by his ideals but by his deeds. The League of Nations failed in its objectives. The only method of overcoming this German sentiment of distrust is to broadcast the outlines of a new order, which by its efficiency in essentials will be fool-proof, disaster-proof and nationalistic-proof.

We cannot afford a Herr Hitler of 1960 to taunt us with the gibe of our past mistakes. We need, indeed, a peace plan which will epitomize the machinery for the creation of the new and permanent overriding sentiment. What is it to be?

The Plan Itself.

The medical profession is used to the improbables and inconceivables which become reality. Only a few years ago we could do little for such diseases as pernicious anaemia, diabetes, myxoedema, streptococcal and gonococcal infections *et cetera*; but now, thanks to revolutionary ideas, the road to cure is open. We are educated to the reverse of the preconceived. If we suggest a union of free democracies with the abolition of passports, regulation of trade facilities, combined defence and commerce, money and postage systems, are we advocating anything more revolutionary than the advent of liver extract, insulin, "Cardiazol", thyroxin or sulphanilamide *et cetera*? We realize that all change requires a period of readjustment. There are facts to be gleaned and difficulties to be faced. But we can visualize the benefits to be gained and cheerfully face the problem in a new light. Are we so devoid

of common sense that we cannot see that the new overriding sentiment of a union of peoples, with its freedom from hampering restriction and its eradication of war, will confer inestimable advantages? As for our fancied loss of prestige, our jettisoning of our old ideas, our usage of new materials, we shall accept them readily in view of the benefits to be received. And surely the greatest honour in the history of mankind will be for those who were the first to plan the complete abolition of wars. Many of us have personal German and Italian friends. Most of us have some foreign ancestry if we could follow our family tree back far enough. We cannot but admire the Germans, because many remedies we use are partly made by German ingenuity and intelligence.

Science has for years adopted a slide rule of merit based on truth and honesty of purpose and ideals. Its honours are bestowed irrespective of race and creed. The medical profession has been so long accustomed to these standards, their extension to the realms of group psychology is a natural process.

The members of our profession should not merely point out, but actively endeavour to create a public opinion on the true facts of war. They should strive for the rapid acceptance of a peace plan based on rational lines. They should insist on psychological advice in the creation of the actual terms, and they must ceaselessly stress the importance of the "O.R.S." factor, the necessity for the creation of a favourite overriding sentiment.

A state of war introduces an element of inertia. Citizens hesitate to act lest they run the risk of a criticism of unpatriotism. This should not apply to the problem under discussion. If the members of the medical profession forthwith organized a conference on the psychological implications of war and peace, they would be performing a patriotic duty. Not merely would they focus public attention on an important means of bringing the war to a victorious conclusion, they would give information as to one means for procuring a permanent peace.

In the foregoing it is implied that federal union between similarly constituted nations is the best means of providing an adequate "O.R.S." factor. It would be the business of the conference to determine the minimum requirements for adequacy. It is possible that this would be less or more than that which serves, for example, to produce an overriding sentiment for a greater Australia or a greater Britain. The minimum must be reducible to determinable factors. It is as finite as an algebraical formula:

$$\text{"O.R.S."} = A + B + C + D$$

If we try to solve the problem by guesswork, by recourse to emotional thinking, by expediencies or by preconceived ideas, then we shall court failure in the scientific arena. We shall certainly fail in the arena of hard facts. Such methods have been frequently exploited in the past. Their failure should deter us from following the same predestined path. A brief analysis will serve as illustrations.

Nation or Power.

"O.R.S."

Ancient Egyptian	Force <i>plus</i> a school for vassal celebrities
Ancient Greek	Force <i>plus</i> rulers intermarrying with vassal princesses.
Ancient Roman	Force <i>plus</i> law.
The spiritual kings	Force <i>plus</i> universal religion.
Napoleon	Force <i>plus</i> puppet kings.
Allies in 1919	Force <i>plus</i> indemnities <i>plus</i> a league of nations.

It must be admitted that even as late as 1919 the scientific elucidation of the group mind was fragmentary. None the less, our ancestors 3,000 years ago were dimly realizing that their conquest and rule by force were insufficient. They sought the "O.R.S." factor and made blind stabs at its perfection. Today, when we have before us such works as the late McDougall's "Group Mind" and Streit's "Union Now", with a host of other authorities who have thought and written on the theme of herd instincts and sociological harmony, we cannot plead ignorance. Today, in fact, we have a unique opportunity of harnessing science to the wheels of international

relationships. They revolve within the ambit of medical science in its broadest sense. It is hoped that our profession will rise to the occasion.

Transition from War to Peace: Emotional Tempo, Disciplined Enthusiasm.

We are tabloid thinkers. We regard war and peace as clear-cut entities. The guns cease to roar, the soldiers are demobilized and peace enters as the twinkling of a star. This conception was responsible for the sad train of events which succeeded the war of 1914-1918. Actually there never was peace. The cessation of one type of hostility was the mere prelude to an equally virulent but less obvious type of national and international warfare. The lesson of this is clear; our soldiers must not disband and rush pell-mell into the divided and chaotic arena of civil life. They must remain soldiers in spirit, if not in uniform, until all disruptive civic forces have been overcome. They must not rest on their laurels, but take a burning and disciplined interest in the ideals of work for all, equality of opportunity and justice in its broadest sense. Armed with such a conception, we shall be saved from the most devastating canker of democratic life—the complacency which allows the dole and pension to "whitewash" our community. It exists because hitherto the peace régime has paid premiums on inaction and stifled the soldier spirit of instant action to combat danger and chaos.

Let us therefore begin to plan for the future by realizing that the war will finish years after the last gun has been fired. It will cease only when our nationals have been educated into the ideals of a new order—a disciplined democracy which has solved the problem of long-range and universal prosperity. In conclusion, and as a final acknowledgement to the help of "The Soldier in Battle", let me borrow a chapter ending: "If you are a good citizen—go to it."

Summary.

1. War is a psychological medical problem made more difficult by the existence of diverse emotional planes. That of pre-war peace is complacency. The drive to victory requires burning hate. A peace plan necessitates detachment, together with an overriding sentiment. The solution of post-war problems will demand disciplined enthusiasm.

2. Victory requires: (a) The overthrow of fear. This can be accomplished on psychological lines which are indicated. (b) The counsel of youth to cope with the fluidity of modern warfare. (c) Adequate motivation.

3. There is urgent need for a peace plan. This, to be lasting, must create a favourable overriding sentiment, for which an abbreviation ("O.R.S.") is suggested. Previous failures are outlined. Reasons are given for belief in federal union as most likely to create an adequate "O.R.S."

4. Our concept of post-war conditions must be based on the realization that disciplined enthusiasm must continue for years after an armistice—indeed, until we have solved the problem of long-range and universal prosperity.

5. It is urged that as war is a psychiatric problem, our profession should organize a conference on the psychological implication of war and peace.

STREPTOCOCCAL TYPES IN SCARLET FEVER: THE ASSOCIATION OF CHANGE OF TYPE WITH COMPLICATIONS AND CROSS-INFECTION.

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WITH A COMMENTARY BY F. V. SCHOLES,
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SEROLOGICAL typing of group A hæmolytic streptococci occurring in scarlet fever patients was begun at the Queen's Memorial Infectious Diseases Hospital in 1938.¹ A survey of the types occurring in Melbourne was made

and the method of routine technique was established. It was then decided to take swabs from the throats of all patients admitted into scarlet fever wards during a period of twelve months, and also to examine as many as possible of the complications occurring in these patients after their first week in hospital.

It is well known that in many cases a change of type of the invading streptococcus occurs,⁽¹²⁾⁽¹³⁾ and it was desired to ascertain to what extent this change of type was associated with definite clinical evidence of complications. Swabbings from the throats of patients were taken as soon as possible after their admission to the hospital. Owing to the extra time and material involved, it was not considered necessary to take nasal swabs except from some patients in whose throats streptococci were not found. The swabs were immediately spread onto plates of nutrient agar containing 7.5% defibrinated sheep's blood. After overnight incubation the individual colonies were examined under a plate microscope, and if, as was usually the case, they presented the same morphological appearances, one colony was subcultured. If there was any notable difference in appearance, two or more colonies were examined. The subcultures were made directly into centrifuge tubes containing five cubic centimetres of tryptic digest broth with 3% trypsinized horse serum added. The centrifuge tubes were incubated overnight at 28° C., as this was found to be the most satisfactory temperature for obtaining workable emulsions of the organisms. After light centrifugalization, if necessary, most of the supernatant broth was removed, and the remaining emulsion was used for typing.

Difficulty in obtaining satisfactory emulsions was experienced mainly with types XVII and VI, and these could in most cases be rendered workable by the addition of a crystal of sodium thiosulphate. Refractory strains needed frequent subculture. Fortunately type XVII forms a characteristic colony on blood agar, and a tentative opinion could be given pending further tests.

The typing was carried out by Griffith's slide agglutination method, and when any doubt arose strains were checked by their fermentation reactions in starch and mannite.⁽¹⁴⁾ The typing serum was obtained through the courtesy of Dr. F. C. Morgan, Director of the Commonwealth Serum Laboratories.

In certain cases, in which either a large quantity of serum was being used, as in the typing of the epidemic strains II, XVII and Wade, or an apparently unidentified strain occurred in a family and contacts (for example, "Wheatland"), the type sera were prepared and absorbed in this laboratory by Mr. A. D. Harvey.

The number of complications recorded, which occurred in patients admitted to the hospital during the twelve months under review, is not complete, as it was necessary to rely on ward reports over a very busy period; but in

TABLE I.
Examination of Scarlet Fever Patients.

Date.	Total Number of Patients from Whom Swabs were Taken.	Total Number of Complications Investigated.
1939—		
May	106	24
June	116	37
July	99	14
August	191	34
September	192	43
October	251	50
November	192	36
December	221	38
1940—		
January	134	17
February	155	26
March	207	14
April	254	49
Totals	2,118	382

TABLE II.
Types of Hemolytic Streptococcus Found Each Month in Cases of Scarlet Fever.

Type of Hemolytic Streptococcus.	1939.								1940.				Total.
	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	
II	80	85	67	140	125	165	102	123	79	96	102	130	1,308
XVII	9	6	7	18	23	19	34	51	22	28	54	67	338
Wade	2	8	—	—	—	27	15	17	8	12	24	33	146
XI	6	2	3	—	9	6	15	6	6	16	6	—	81
VI	2	1	5	1	6	9	8	11	8	2	1	4	68
Hale	—	1	5	1	4	4	—	1	1	—	—	1	19
Alii	—	—	1	—	6	2	—	1	1	—	1	2	14
XIX	—	—	1	1	—	—	1	—	—	—	1	3	7
XXVII	1	1	—	—	—	—	1	—	1	3	—	—	9
John	—	—	—	—	—	1	—	—	—	—	—	—	1
Hempston	—	—	—	—	—	1	—	—	—	—	—	—	1
Wheatland	—	—	—	2	—	—	—	1	—	—	—	—	5
Untyped	3	4	1	3	2	2	7	5	2	4	3	4	40
None found	3	8	9	16	16	13	9	5	6	4	3	4	96

TABLE III.
Monthly Total of Instances of Each Complication Occurring Monthly.

Date.	Otitis.	Nephritis.	Tonsillitis and Adenitis.	Relapse.	Total Number of Complications.	Total Patients.
1939—						
May	14	1	5	4	24	106
June	25	1	10	1	37	116
July	5	—	7	—	14	99
August	20	3	10	1	34	191
September	23	5	11	4	43	192
October	16	8	21	5	50	251
November	20	2	9	5	36	192
December	22	5	9	2	38	221
1940—						
January	5	3	7	2	17	134
February	15	2	6	3	26	155
March	4	—	5	5	14	207
April	14	5	27	3	49	254
Total	183	37	127	35	382	2,118

TABLE IV.
Monthly Number of Complications Caused by Change of Type of Streptococcus.

Complications.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	Totals.
Otitis.	2 17 17 2 17 2	2 17 2 17 2 6 17 2 W ¹ 2 U ¹ 2	6 2	2 6 17 2	2 17 12 6 12 6 W	2 W 12 W	2 17 12 6 12 6 17 11 17 11	2 17 17 2 17 2	2 17 2 U	2 W 17 2 17 2	17 2 6 2	2 17 2 Wh	36
Nephritis.	2 N ¹	2 N	2 N	2 N	2 N 12 N 12 N	2 N W N W 2	2 N 12 N	2 N 2 17 17 2	2 N 2 N W 2	2 N 2 N		17 2 W 2	24
Tonsillitis and adenitis.	2 11	17 2	2 17 6 2	2 17	2 17 6 2 11 2	2 17 2 17 2 17 W 2 W 2 11 2	2 17 17 2 17 2 W 2 N 2	2 17 2 17 2 17 6 2 W 2	2 17 2 17 A 2	2 17 2 U Wh 2	2 W W 2	2 17 2 W 17 2 17 2 W 2 W 2 W 2 W 2	43
Relapse.	N 2 N 17 N 17 6 2	2 2		N 17	N 2 N 2 N 2 6 2	W 2 6 2 6 2 A ¹ 2	2 17 2 17 2 17 17 2 6 2	17 2 6 2	6 2	N 2 U 2 N 17	17 2 17 2 17 2 W 2 N 2	W 2 6 2 N 2	35
Total changes of type	9	9	4	6	14	18	17	14	10	11	9	17	138
Total complications	24	37	14	34	43	50	36	38	17	26	14	49	382

¹ A = All, N = none found, Wh = Wheatland, W = Wade, U = untyped.
Figures in italics denote original type; figures in heavy type denote change of type.

the majority of cases the complications were recorded and the streptococci typed. The complications chosen to be investigated were otitis, tonsillitis and adenitis, and nephritis, occurring after the patient's first week in hospital, and any recurrence of rash accompanied by clinical evidence of scarlet fever. When otitis occurred, a swab was taken from the discharge; in the presence of other complications the throat was swabbed. Swabs were plated and examined as before, any change of type being noted.

As the total number of cases of nephritis examined is unfortunately small, it was decided to include those which occurred in the six months from June to November, 1940. These numbered 46, and in 26 of these no streptococci were recovered when swabs were taken at the onset of nephritis, in four a change of type occurred, and in six the same type was recovered as in the original swab.

COMMENTARY.

(F. V. Scholes.)

Manifestations of streptococcal infection in general and of scarlet fever in particular are so protean and vary so much from decade to decade and even from year to year that it is neither safe nor justifiable to draw finite conclusions, even from such a large series as that submitted by Dr. Kelsey. One cannot be certain that such conclusions will be borne out or that the picture will be reproduced in any future series of similar size. Nevertheless, when clinical impressions have been formed over a long period of years and bacteriological evidence is found to agree with such preformed opinions, the probability of their being correct is certainly strengthened.

The frequency of complications during convalescence from scarlet fever has been discussed for generations past, and I myself have often written and talked at wearisome length on the subject. Current opinions overseas have been confirmed bacteriologically by many workers, especially during the past decade. Briefly, these have been that in multiple bed wards most complications are due to cross-infection, and that usually cross-infection consists in conveyance to a patient of a type of streptococcus different from that with which he was originally infected.

It would follow that indiscriminate housing of patients in multiple bed wards is wrong and that either (a) they should be nursed in single bed cubicles or at least segregated according to the type with which they are infected, or (b) they should be nursed by "barrier" methods. Of course this system can be applied successfully while they are confined to bed, but provision must be made for the different groups during the walking stage.

It is clear that the amount of cross-infection in the "bed" stage will be governed largely by the standard of nursing, by the spacing of beds and by the adequacy of ventilation.

In this hospital we have had no evidence that early complications, such as otitis or cervical suppuration, are associated with change of type or are due to cross-infection, and Dr. Kelsey has limited her investigations to those occurring later.

Complications selected were otitis, tonsillitis and adenitis of convalescence, acute nephritis and relapse. Late cases of rheumatism were few and were not investigated, nor were cases of persistent rhinorrhœa of convalescence.

The principal types of streptococci causing scarlet fever in the 2,118 cases were as follows:

Type II in 1,303, or 65% of those in which streptococci were found.

Type XVII in 338, or 17% of those in which streptococci were found.

Type Wade in 146, or 7% of those in which streptococci were found.

Type XI in 81, or 4% of those in which streptococci were found.

Type VI in 58, or 3% of those in which streptococci were found.

These five types accounted for 96% of the total. Type II was predominant throughout. Type XVII became more prevalent in the spring (this was noted also in the spring of 1938). Type Wade reappeared in the late spring, and both Wade and XVII reached their peak of frequency in the following April. However, even in that month type II retained its dominance, accounting for 52% of all cases in which hæmolytic streptococci were found.

The tables show no evidence of any relation between the appearance of new types, or increasing proportion of

any particular type, and liability to complications. Complications were fewer in the warm months, November to March, than in the colder months, April to October; but the differences are hardly significant. Nor is there any indication that any one type is particularly aggressive and likely to produce complications. In those cases in which the onset of a complication was associated with change of type, the change was to type II in 61%, to type XVII in 22%, to type Wade in 8%, to type XI in 3% and to type VI in 5%.

A reference to Table II, showing the relative prevalence of types, reveals no major discrepancy, though with type XVII the rate is rather high. But an examination of all cases of scarlet fever due to type XVII reveals a curious fact, demonstrated in Table V.

TABLE V.

Age Group. (Years.)	Patients with Attacks of Scarlet Fever due to Type XVII Haemolytic Strepto- coccus. (Percentage.)	All Scarlet Fever Patients. (Percentage.)
Under 5	9	20
5 to 10	21	39
10 to 15	38	18
Over 15	32	23
Total	100	100

Of all patients with scarlet fever in whom the attack was due to type XVII, 70% were more than ten years old. One may think that probably type XVII is a type comparatively new to this country. A strange explosive epidemic of streptococcal infection occurred in the early spring of 1938. One medical officer who had been in close and continuous contact with scarlet fever and other streptococcal infections for nearly twenty years had a severe attack of septic throat with great prostration, and type XVII was isolated from the throat.

Otitis.

One hundred and eighty-three patients developed otitis at some time after the beginning of the second week. In only 36 of these cases was a change of type found; in the remaining 147 the streptococci found immediately after its onset were of the same type as those found on the patient's admission to hospital. So in these 147 cases there is no evidence that otitis resulted from cross-infection.

Tonsillitis and Adenitis of Convalescence.

There were 127 cases of tonsillitis and adenitis of convalescence. This complication rarely occurs in the second week or in the early part of the third. Most commonly it appears late in the third week, and thereafter at any odd time. Forty-three of these 127 cases were associated with change of type.

Relapse.

Thirty-five cases of relapse were recorded, but in 12 of these no haemolytic streptococci had been found in the throat on the patient's admission to hospital. Some of the twelve patients were admitted in the stage of desquamation; others had "surgical scarlatina" with no obvious throat infection, and in others possibly the diagnosis was wrong. In 22 of the 23 cases bacteriologically confirmed there was a change of type, and the relapse was presumably due to cross-infection. Nearly all occurred in the third or fourth week.

Discussion.

Relapse is almost always due to cross-infection. One would expect this. The classical symptom of relapse is a scarlet rash, due to local action of toxin. Normally in scarlet fever antitoxic immunity is well established early

in convalescence, and one would not expect a recurrence of rash unless a new erythrogenic strain of toxin were introduced.

But local complications, such as otitis, tonsillitis and cervical abscess, are due to local extension of bacterial infection. In this particular series 310 such complications were investigated, and in only 79 instances was a change in type demonstrated. If we accept the current interpretation of these figures, cross-infection was the cause in only a quarter of them.

This conclusion, and the data leading to it, are at variance with the experience of a number of workers overseas. For instance, de Waal studied 455 cases with complications (in all stages):

Two hundred and eight (61.5%) were due to a type of haemolytic streptococcus other than that with which the patient entered the hospital, whereas only 92 (20.2%) were due to the same type. In patients who had been two weeks in hospital 90% of complications were due to new types of streptococci.

I would point out the following considerations:

1. In the series presented by Dr. Kelsey the number of really prevalent types was very small. Type II accounted for 65% of all cases, and type XVII for 17%. This contrasts with the multiplicity of types found in groups of cases in other countries. Thus the conclusion arrived at theoretically, that only a quarter of recorded complications were due to cross-infection, may not be correct. Some children may have got rid of their infection with type II and have been reinfected later with the same type from other children. This is likely.

2. At Fairfield many of the patients were nursed in small wards containing two or four beds, and with a single type predominating (type II) the chances of cross-infection with another type were lessened.

3. In this country, where doors and windows can be kept open in almost all seasons, and where convalescents can spend most of their time in the open air, cross-infection at any rate of a massive character, should be less likely.

4. In many hundreds of cases I have observed the onset of otitis and of adenitis in circumstances in which, to say the least, the likelihood of cross-infection was very small.

Nephritis.

The total number of cases of acute nephritis, occurring in about 3,200 cases of scarlet fever, was 83. In nearly all of these the onset was abrupt and pronounced and between the eighteenth and twenty-third day. In not more than four or five was it earlier, and in only one later. Swabs were taken as soon as possible after the onset of nephritis, generally within twenty-four hours. In 10 cases there was a change of type (either to type II or to type XVII). In 29 cases the streptococci found were of the same type as on the patient's admission to hospital. In 44 cases no streptococci were found. These findings agree with other evidence that the essential mechanism of nephritis is not connected in any way with reinfection, cross-infection or persistence of infection.

The tonsillitis (sometimes exudative), which so often immediately precedes the onset of nephritis, may contribute to the development of the nephritis, but may be coincident and no more. When obvious tonsillitis is present, the lymph glands are usually swollen, hard, painful and tender. But in most cases of nephritis they are not painful or tender; they are soft and the swelling is rather diffuse. The pathological process in them is probably similar to that in the glomeruli and other renal tissues.

Conclusion.

The general conclusion is that, while cross-infection as measured by change of type is important and frequent, nevertheless in this country at the present time the complications of convalescence, which are usually ascribed to cross-infection, cannot in the main be so explained on the basis of change of type.

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Reviews.

LAWRENCE'S "DIABETIC LIFE".

For any medical text-book to arrive at its twelfth edition in sixteen years and to be translated into four foreign languages is at least exceptional and reveals a popularity which must be based on usefulness, readability and universal demand. The size of Lawrence's book "The Diabetic Life"¹ has gradually grown in proportion to the increase in our knowledge of the disease and its treatment. The original text has required scarcely any alteration, and none of it could well be omitted or further summarized. The short preface to the present edition answers two questions which have frequently been asked of the author since food rationing came into force in England. Firstly, vitaminized margarine and butter are of equal food value and can be mixed with milk in a household emulsifier to form a satisfactory cream. Secondly, the Food Ministry of Great Britain has sanctioned the substitution of the diabetic's sugar ration by extra meat and fat rations. This important modification, we are told, was engineered by the Diabetic Association of Great Britain, and shows what an important function such an organization can perform in time of national emergency.

Dr. Lawrence has included in each volume of this edition a loose slip containing golden advice to diabetics in a war-stricken country, where supplies of insulin, needles *et cetera* may become irregular or even cease. These instructions were recently printed in *The British Medical Journal*, and were noted in the editorial pages of this journal in the issue of May 10, 1941.

With regard to the further contents of this manual, the early section, which deals with carbohydrate metabolism and diabetic physiology, has not been greatly changed. A new paragraph describes the modern conception of ketosis, in which it is stated that an ultimate 100 grammes of carbohydrate (glucose) is the minimal requirement to prevent any ketosis. The former conception of the necessity for an exact glucose:fatty acid ratio has been abandoned. In a discussion on aetiology, the large nervous factor is acknowledged: "When shares go down in Wall Street, diabetes goes up." The assertion that jaundice and gall-bladder disease are frequently associated with diabetes does not accord with our own experience.

Banting's death had not occurred when this edition went to press, but will no doubt find reference in the preface to the next.

Lengthy consideration of new theories and hypotheses as to the mechanism and types of diabetes are wisely omitted from a manual of this character. A discussion upon the determination of high leak point and of its variability could be prolonged with advantage, together with more notes upon practical difficulties in the treatment of coma caused by glucose-ketone differentiation on the part of the kidneys. The "line-ration" scheme for diet prescription, which is so well known, was altered in the eleventh edition so as to contain 10 grammes of carbohydrate per line. The "five-gramme" scheme is also retained as an alternative for use with more intelligent patients. Our own experience, however, is that at the outset, for both simplicity and disciplinary purposes, a patient is usually best advised to keep to a constant unvarying diet arranged as a single menu, and that choice and substitution may follow later as

privileges accorded to the initiated. Also advocacy of an unweighed qualitative restriction of carbohydrate alone in cases of mild diabetes has its dangers, unless the intake of fat is known. Unfortunately patients sometimes tend to compensate for loss in satiety value in these circumstances by raising the relative intake of fat and protein. The optimum moment of the day for a single determination of the blood sugar level is stated by Lawrence usually to be 11 a.m. to noon in the case of a diabetic taking ordinary insulin before breakfast, and yet this important and comprehensible fact is almost entirely forgotten in this country, where estimations of fasting blood sugar are still the routine. This criticism does not refer to investigation of patients receiving zinc protamine compound. In the same way Dr. Lawrence continues to emphasize the impossibility of prediction of the individual level of blood sugar at which hypoglycæmic symptoms will begin to appear.

In the chapter upon the treatment of coma appear the following words: "No practitioner should be deterred from giving a large dose of insulin, such as 40 to 50 units, on diagnosis (of coma) by the fear of hypoglycæmia." This statement should be emphasized in large and very black type. Dr. Lawrence advocates routine testing of the urine in coma with silver nitrate, until sufficient sodium chloride has been given by mouth to counteract any salt deficiency or alkalosis. He also advises the giving of a large dose of zinc protamine insulin at the outset of pre-coma treatment; but our experience has shown that this procedure occasionally has its attendant dangers. He advocates the administration, in coma, of suprarenal cortical extract when improvement is slow in forthcoming. The value of injections of vitamin B₁ in the treatment of diabetic neuritis receives a brief mention. A larger discussion on the care of the feet is required, and also an outline of the means and relative value of methods intended to improve peripheral circulation. Rather more information about haemochromatosis would not be unwelcome. It has been demonstrated recently that cooking sometimes increases the vitamin C content of certain vegetables instead of reducing it.

Lawrence does not consider that transmission of the diabetic tendency as a Mendelian recessive is proven, and advocates early interruption of pregnancy in women who already have children. With this we do not altogether agree. If a woman already has a diabetic child, the probability that the next child will become diabetic is highly unlikely, and further pregnancy has frequently been advised in such instances without subsequent cause for regret. Obesity as a cause of insulin resistance, unassociated with other signs of pituitary dysfunction, has not in our experience been a difficulty. A commoner form of pseudo-resistance has been the continuous injection of insulin into scarred subcutaneous tissues.

The section on "Home Life and Holidays" is most valuable, and holiday facilities for diabetics have been developed very greatly through the agency of the Diabetic Association. The number and value of diabetic food recipes has been enlarged by the inclusion of some of the excellent formulae published in the *Diabetic Journal*. This, in more respects than one, is a more important and helpful publication to the diabetic than the morning newspaper.

The work concludes with a twenty-page chapter upon protamine insulin compounds. The importance of this section claims consideration earlier in the manual. Dr. Lawrence shares the general opinion that most diabetics are better if some of their insulin is given in the combined form, and all who have used this type of insulin extensively will agree with his statement that "even more than with soluble insulin, the individual study of each case is necessary to obtain the best results" or, one might add, to obtain any good result at all. This chapter is the best discussion of the use of zinc protamine compound in our experience. We agree wholeheartedly with the author's conclusion that it is rarely possible to keep the urine constantly sugar-free without risk of hypoglycæmia, and that a trace of sugar in the urine is actually desirable, especially when large doses are required, in view of the unfortunate and unpredictable irregularity of the action of zinc protamine compound. We do not agree that any diabetic, however severe his condition, should receive more than 35 to 40 units of his insulin in the combined state, in view of alarming experiences of hypoglycæmia when zinc protamine is used in doses as high as 60 units or thereabouts.

Lawrence advises mixture of the two forms of insulin, soluble and insoluble, in the same syringe prior to administration, a procedure which is risky, in so far as it has been shown that the soluble fraction may be more quickly combined with the protamine than was formerly thought.

The manual remains the practitioner's best practical guide to the everyday management of diabetes available in our language. It is simple, complete, and rich in truth.

¹ "The Diabetic Life: Its Control by Diet and Insulin", by R. D. Lawrence, M.A., M.D., F.R.C.P.; Twelfth Edition; 1941. London: J. and A. Churchill Limited. Large crown 8vo. pp. 252, with 18 illustrations. Price: 9s. net.

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SATURDAY, JUNE 14, 1941.

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References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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SCIENCE, COMPLACENCY AND WAR.

"Two contrary laws seem to be wrestling with each other at the present time; the one a law of blood and death, ever devising new means of destruction, and forcing nations to be constantly ready for the battlefield—the other a law of peace, work, and health, ever developing new means of delivering man from the scourges which beset him.

"The one seeks violent conquests, the other the relief of humanity. The latter places one human life above any victory; while the former would sacrifice hundreds of thousands of lives to the ambition of one . . . which of these two laws will ultimately prevail God alone knows."

These words of Louis Pasteur, written about fifty years ago, were quoted by the late T. Brailsford Robertson, sometime Professor of Physiology and Biochemistry in the University of Adelaide, in an address on "Science and the War", delivered in 1918 and published after his death in a book of essays and addresses entitled "The Spirit of Research". Robertson went on to remark that if the war (of 1914-1918) awakened mankind to a realization, not merely of the passing utility of science in the immediate war crisis, but of its organic function in society, of its fundamental significance to all men, in war, in peace, in health, and in disease, materially and spiritually, of its enduring importance as the preeminently creative factor in civilization, then indeed would it be possible to hope that the war then being waged would in very truth be the last. Robertson believed that the order of society which attained the greatest harmony of its social consciousness with scientific thought must inevitably attain domination of the world. He also defined the spirit of research as "that spirit which inquires for the purpose of making things better than they are, and which urges

humanity towards higher purposes and more worthy achievements in every aspect of our lives".

Louis Pasteur's words were prophetic and Brailsford Robertson's insistence during the last war on the fundamental spiritual significance of science should be reemphasized today, for if we realize this significance we shall surely display the spirit that inquires for the purpose of making things better than they are. On previous occasions reference has been made in these columns to the danger of what has so aptly been termed an intellectual black-out consequent on the world war, and incidentally to the part that Australia should take in the prevention of such a dire calamity. It is a wholly favourable and healthy sign that in Great Britain, fighting as she is for her very life, scientific journals continue to appear in their usual and regular fashion, and that books which are at once the offspring and food of the intellect are published every week in spite of the heavy damage rained on so many publishing houses from the skies. It is true that many scientific papers of today have a bearing on war, its conduct and its sequelæ, but at the same time there is a large number that are devoted to pure science—the acquisition of knowledge of natural phenomena and of the various relationships between them. Even those papers that have a direct bearing on the war are not all the direct product of the war. Brailsford Robertson reminded us that the last war merely precipitated a number of inventions that were already on the verge of practical realization, or dragged into prominence discoveries up to that time disregarded; the same statement will probably be true of the present conflict. The conclusion is thus justified that the pursuit of science is as necessary in war time as it is in times of peace and this for reasons that are by no means all connected with war.

Professor A. V. Hill, of University College, London, has recently delivered an address before the Parliamentary and Scientific Committee of the House of Commons on the subject of "Science, National and International, and the Basis of Cooperation". Extracts of this address have been published in the February 21, 1941, issue of *The Engineer*. Many of Professor Hill's statements are so arresting that they should be brought to the notice of all in the British Commonwealth of Nations who have any understanding of the value of science and any concern for the safety of the State. He referred to the necessity for guarding the independence, the spiritual integrity, of science. When science was wholly subservient to the State its soul was not its own. While he did not deny the need for scientific organizations within the State, or for liberal support by the State of scientific research, there were in his opinion several things to be feared. Though in the published excerpts of the address that are available Professor Hill did not discuss at length all the possible dangers, they should be mentioned in this place. The first danger seen by Professor Hill is that a condition of stagnation and complacency tends to develop in any scientific department or establishment that is cut off from outside criticism or ideas—"the reduction of science to official routine can be a real menace". The second danger is that science will be planned by administrators or officers "instead of by young men with their sleeves rolled up, in laboratories or work shops". Thirdly, there is a disadvantage in the separation of teaching from research—the next generation will be the losers because they will not be inspired by

the sight of discovery taking place where they are taught. Fourthly, there may be a decrease in the influence and prestige of independent scientific bodies which provide cross connexions between groups which might otherwise be isolated. The fifth danger is that he who pays the piper may call the tune and that research may be required to be devoted primarily to objects which the politician or the civil servant regard for the moment as of national importance, or even, as in Germany and the Soviet, to bolster up theories which the official philosophy of the State prescribes. A great deal might be written about each of these five points, for each of them is a real danger; the present purpose, however, will best be served if we follow Professor Hill's arguments. He insists that to avoid the dangers enumerated by him the independence and integrity of science must be carefully preserved in universities, in learned societies and in the associations and institutions devoted to the advancement of knowledge. "Whenever State support is given, a buffer should be interposed", similar to that provided by certain councils in England such as the Medical Research Council; here the "buffer" is provided by the fact that the members of the Councils are chiefly independent scientific men. There is no doubt that in the future more and more of the financial burden of research will be taken over by the State, and Professor Hill holds that we must watch that the strength of this "buffer" safeguard is fully maintained and that it does not become a formality. This should be remembered in Australia where the "buffer" or non-departmental members of the National Health and Medical Research Council are regrettably few.

Professor Hill has some pungent remarks to make on scientific research in the defence services, research which is undertaken on a grand scale, and "which cannot be controlled directly by outside independent bodies". In these establishments particularly he thinks that the danger of stagnation and complacency exists. "They are devoted to specific service purposes, often of necessity secret, and the condition of secrecy prevents them, in ordinary times, from attracting many of the ablest and brightest minds, who prefer the freer atmosphere of the universities, the possibility of discussing and publishing their results, and the recognition of their colleagues resulting therefrom. Consequently, in war, those who direct these establishments are often people who have arrived at their positions by seniority and long service, during which they have been largely isolated from the ideas and criticism of current scientific thought; it has been difficult for them not to become officials rather than working scientists." These are hard words and Professor Hill points out that in an emergency such as the present able men have to be brought in to fill posts to which they cannot do justice until they have had experience of service conditions and needs. He has two suggestions which he thinks may solve the trouble. The first is that some kind of an advisory council should be appointed and that it should consist partly of men chosen for their special knowledge and for their wide contact with the scientific community and partly of official scientific people of different departments. This sounds as if it should be satisfactory; whether it would work or not would depend on the individuality of the members. There is no guarantee that the members of the advisory council would not become smitten by the very complacency that they had set out to prevent. It

would be much better to prevent the original members of departmental laboratories from becoming complacent in the first instance, and here Professor Hill's second suggestion seems adequate. He thinks that in ordinary times regular interchange should be arranged of personnel between government research establishments and organizations on the one hand and the universities and other independent research institutions on the other. This is something like a child's game of "general post", such as we have from time to time suggested as likely to be salutary to the hide-bound and blinkered members of certain specialties in medicine. Professor Hill asks why should not the research workers in Government laboratories be just as regular attendants at the meetings of scientific societies as those in other institutions. Why indeed? What a shock it would be for regular attendants at British Medical Association Branch meetings in some of the Australian States if medical officers from government research laboratories were to appear and to take part in Branch discussions! How useful it would be to both the Branch and the laboratory officers! In reference to government laboratories Professor Hill writes: "I sometimes thought before the war, how good it would be to take a mission, harmonium and all, to one of these most important—and the most dead-alive—of these places and try to stir up a little general scientific enthusiasm."

But here we must leave Professor Hill. He has done well to emphasize once more the spiritual integrity of science and to try to eradicate complacency from scientists in high places in the Old Country. In Australia his words should be "read, marked, learned and inwardly digested". In this country we have to fear complacency not only in government departments, among scientists and among medical practitioners; we have to fear complacency in the whole community. Unless we are alert in mind and audacious in action we cannot attain harmony of social consciousness and scientific thought and we shall not serve the law described by Pasteur, which seeks means to deliver man from the scourges that beset him.

Current Comment.

EPITUBERCULOSIS.

At the forty-fourth annual meeting of the American Association of Pathologists and Bacteriologists in 1940, a paper by Kornel L. Terplan¹ on epituberculosis raised an extensive and somewhat stormy discussion. One member insisted on obtaining a well-defined definition not only of the clinical term "epituberculosis", but also of the nature of the underlying lesion. While an answer to the first question does not present great difficulties it is certain that the discussion on the second problem will not have been the last on the subject. The term epituberculosis, first introduced by Eliasberg and Neuland in 1920, is clinically used to designate most extensive and massive "infiltrations" of the lung, especially in the upper fields, which are seen in infants and children, known to have a tuberculous infection, but who show amazingly mild constitutional symptoms in spite of the extensive area of apparent pulmonary consolidation. The condition is frequently discovered incidentally by X-ray examination and the massive shadows seen in the films usually disappear completely within a few months. There seems to be no doubt that the condition has a close connexion

¹ *The American Journal of Pathology*, September, 1940.

with the primary form of tuberculosis of the lung, the primary complex of Ghon and Ranke. Evidence is accumulating that the Assmann's focus of the post-primary, the adult, form of tuberculosis is a rather similar condition. Also here, atelectasis seems to be the underlying cause for the X-ray findings, at least during the first stages of development, but there is one important difference, namely, regression of the shadows does not occur regularly, and quite frequently cessation, the formation of a special type of cavity and further spread follow.

The difficulty in finding an answer to the question of the actual nature of the underlying lesion lies in the slight impairment of the general health of such children, for they usually do not die while suffering from epituberculosis and therefore pathological examinations of the lungs are very rarely possible. The first to collect a series of cases in which post-mortem examinations were made was R. Roessle.¹ His patients were under clinical observation for a fairly long time and manifested all the typical symptoms and signs of epituberculosis. In contrast to the common course of events, however, in most of his cases the lesion did not finally disappear, but signs of a general spread developed and death occurred from meningitis. The same holds for a series of cases presented by R. H. Fish and W. Pagel² and for the most recent by K. L. Terplan.

Until the publication of these papers the view commonly held was that the X-ray signs were due to a bronchopneumonia produced either by the usual organisms or by the tubercle bacilli themselves. Although the latter suggestion had to be considered as a very uncommon form of reaction of the lungs against the tubercle bacillus—it does not occur otherwise—it seemed to derive some support from the findings of tubercle bacilli in an occasional aspiration from such foci. This is the opinion still held by a majority of pediatricians. Roessle was able to show that in most of his cases the shadow-producing areas were free from tuberculosis. What had happened was that a caseous bronchial lymph gland had pressed against the bronchus thus obstructing its lumen and atelectasis of the corresponding part of the lung resulted. He could even demonstrate a case in which clinically the lesion had disappeared, but in which the post-mortem specimen clearly showed the residuum of a former atelectasis. In his opinion, therefore, "epituberculosis" is atelectasis of a certain part of the lung due to obstruction of its bronchus by a caseous lymph gland. Fish and Pagel arrived at somewhat different conclusions. Although they also found the atelectasis, they furthermore discovered peculiar granulomata in the interstitial tissue of such areas, composed of the typical elements of tuberculous granulation tissue but not arranged in typical tubercles, and they found in them either very few tubercle bacilli or none at all. On account of certain experimental evidence they interpret the lesion as a special type of allergic reaction against tuberculous protein rather than against living tubercle bacilli. It remains doubtful whether their few cases were truly representative of "epituberculosis" or whether they happened to observe a rather similar but not identical condition. Terplan's series is of even more interest. Roessle had already seen a case in which a tuberculous gland had broken into the bronchus (a secondary infection of the atelectatic area resulting therefrom). In Terplan's cases obstruction of a bronchus was found (as by Roessle), but the obstruction was due not to pressure from without, but to the development of tuberculous granulation tissue within the bronchus. Atelectasis of the corresponding lung tissue without tuberculous infection was seen as the result of this obstruction.

It seems therefore safe to summarize the present state of our knowledge as follows. The still widely prevalent idea that a specific or non-specific bronchopneumonia is the underlying condition of the clinical syndrome "epituberculosis" is not supported by the actual findings in cases in which post-mortem examinations have been possible. The evidence obtained clearly indicates that the lesion

producing the typical X-ray shadows is atelectasis of a considerable area of lung tissue and this atelectasis is due to obstruction of the lumen of a bronchus either by pressure of a caseous bronchial gland from without or to the development of tuberculous granulation tissue within the bronchus. A secondary tuberculous infection of the atelectatic area may take place. This seldom occurs in epituberculosis, but rather frequently in the related condition of Assmann's focus.

KANGRI-BURN CANCER.

THE Kashmiri protects himself against the cold of his native hills by holding next his skin the *kangri*, an earthenware, wicker-covered bowl containing hot ashes. Epitheliomata (*kangri*-burn cancers) sometimes develop at the sites subject to the greatest heat—the anterior abdominal wall and the medial aspects of the thighs. *Kangri*-burn cancer has recently been discussed by Ernest F. Neve, who has had a long experience among the people of Kashmir.¹ It has been suggested that exhalations given off by the smouldering charcoal are the cause of *kangri*-burn cancer, and analogy has been drawn with coal-tar cancer and chimney-sweep's cancer; but Neve is convinced that the recurring irritation of the skin by heat is responsible. He points out that dermatitis is common at the sites of application of the *kangri*, and not infrequently actual burning of the skin occurs. The scars resulting from the healing of the burns are peculiarly liable to break down into epitheliomata. Neve recalls seeing in his student days a man with a fungating ulcer on the front of the leg; this man had been accustomed to sit at his work with his leg against a hot water pipe. Neve believes that he was suffering from a neoplasm essentially similar to *kangri*-burn epithelioma.

Kangri-burn cancer does not appear until the victim has reached middle age or old age, though the *kangri* may have been used from childhood. Neve suggests that the thermal irritation starts epithelial proliferation and that the "waning influence of endocrine balance, which becomes more marked in elderly people, and the loss of a measure of trophic nerve control, allows these epithelial elements to escape regulation and form new growths". Men are more liable to the disease than women, presumably because the women do not have the same opportunity for prolonged use of the *kangri* as men. In this connexion it has been said that Chinese men are very susceptible to gastric carcinoma because they are in the habit of bolting their rice while it is very hot; the women have to wait until the men have finished and the rice is no longer hot. *Kangri*-burn cancer is not highly malignant. The lymphatic glands in the area of drainage appear to be involved fairly early; but the lymphatic vessels themselves seem to escape. Recurrence is comparatively rare, providing the local growth is widely excised and the affected lymphatic glands are removed. But extensive operation, such as for cancer of the breast, is unnecessary. The duration of the disease prior to the patient's seeking medical advice is often one to five years or longer. Neve remarks that "the special importance of the *kangri*-burn cancer is the relation which it bears to the causation of cancer", for it is quite obviously caused by a physical irritant, heat rays. He admits that the exact aetiology is speculative; for so little is known about the control of growth of the skin. "On a healing granulating surface we put a Thiersch skin graft or use Reverdin's method; that skin grows. Why does it stop growing when it has filled its needed space?"

Neve's brief communication, if it does nothing more, recalls us to a realization of the necessity of studying first principles; if we would understand the nature of neoplastic growth we must first understand the growth of normal tissue.

¹ *Virchows Archiv*, Volume CCXCVI, 1935-1936.

² *The Journal of Pathology and Bacteriology*, Volume XLVII, 1938.

¹ *The Indian Medical Gazette*, March, 1941.

Abstracts from Medical Literature.

PÆDIATRICS.

Treatment of Epilepsy with Phenobarbital-Belladonna.

LEWIS H. LOESER (*Archives of Pediatrics*, February, 1941) has made a study of twelve children, suffering from epileptic phenomena, who were treated with phenobarbital and belladonna alkaloids. Nine of the children showed a marked improvement. Both phenobarbital and belladonna have been widely used separately in the treatment of convulsive phenomena. In 1904 Cushman showed that the levorotatory form of belladonna alkaloids is nearly two hundred times as active in affecting the vagus nerve endings as is the dextrorotatory form. Furthermore, he demonstrated that the dextrorotatory component of the racemic alkaloid atropine sulphate is a definite and potent cerebral stimulant. Stoll in 1925 produced a reconstitution of the pure crystalline alkaloids of *Atropa belladonna*, which contained only levorotatory components. In 1931 Freidberg, using the undifferentiated belladonna alkaloids in conjunction with phenobarbital, found that this combination was synergistic, each drug greatly enhancing the effect of the other on the central nervous system. These observations were confirmed by Gordonoff. However, the differentiated levorotatory alkaloids of belladonna as developed by Stoll were found to be more effective than the undifferentiated in the synergism with phenobarbital, because they are not only an extremely potent form of the alkaloids, but also carry none of the undesirable side-effects, such as cerebral stimulation. The drug used in the present series was "Belladonal" in tablet form, each of which contained three-quarters of a grain of phenobarbital and one two-hundred-and-fiftieth of a grain of the total levorotatory alkaloids of *Atropa belladonna*. The tablets were grooved, and it was thus possible to break them into halves and quarters. The twelve children were placed under treatment for periods varying from three to eighteen months. Eleven of the twelve, previous to treatment, suffered from repeated *grand mal* attacks. The twelfth child was severely pyknoleptic. The entire group averaged 55 convulsions a week before treatment, an average of 4.6 convulsions per child per week. The medication was prescribed in divided doses three times a day before meals, or four times a day, the additional dose in the latter case being given at bed-time. The initial dose was varied in each case, and depended on the age of the child, the severity of the complaint, and the judgement of the physician. From this point the dose was gradually worked up either to a point of satisfactory therapeutic effectiveness or to a point at which it became clear that a further increase would not alter the unsatisfactory result (one case). In no case were symptoms of belladonna intoxication observed, nor was it ever necessary to diminish dosage because of excessive depression of the patient. The average dose for the entire group (ages varied from two years to fourteen years) was approximately two and three-quarter tablets a day. In nine

cases the results were excellent. For the entire group the weekly average of convulsions was reduced from 55 to 10, an individual average reduction from 4.6 convulsions to 0.8. Another striking finding was an amelioration in the severity of the convulsions themselves. Without exception they lasted for a much less time and there was a great deal less motor activity than previously. The authors state that although no definite conclusion can be drawn, the results with this treatment as reported in the literature and confirmed by this small series justify further clinical study and trial.

Treatment of Chorea with "Nirvanol".

HARRY M. GREENWALD AND BERNARD GREENBERG (*Archives of Pediatrics*, January, 1941) record the successful treatment with "Nirvanol" of twenty-one patients suffering from chorea. In their experience they encountered no untoward effects from the drug. The rash, fever and leucopenia which developed as a result of the administration of the drug, cleared up after therapy was discontinued and no sequelae were observed. A uniform dosage of two and a half grains of "Nirvanol" was administered three times a day regardless of the age of the patient or the severity of the disease. The drug was administered until an elevation of temperature occurred or the typical rash appeared. The total mean average dose was 60 grains. The lowest amount in any single case was 35 grains and the highest 130 grains. The authors state that it is not necessary for both the rash and an elevation of temperature to occur in order to achieve the good effects of treatment. Wechsler recommends that eosinophilia alone be taken as an index for the reaction of "Nirvanol" and for the amount to be administered. In other words, he found that the presence of leucopenia and eosinophilia even in the absence of fever and rash were sufficient on occasion to interrupt the treatment. In the present series either the rash or an elevation of temperature was used as an index for the discontinuance of the drug. In four cases neither rash nor elevation of temperature occurred and the criteria then used for discontinuing therapy were increasing somnolence and a gradual disappearance of choreiform movements. A characteristic "Nirvanol" rash developed in eighteen of the children. The rash made its appearance in one case on the fourth day after treatment and in the others from the seventh to the twelfth day after treatment. In six patients the rash caused severe itching. The rash lasted on an average for four days, the shortest period being ten days and the longest eight. A definite decrease in the total white blood count occurred in practically every instance, but not a single case of agranulocytosis was observed, nor were there any signs present that could be attributed to the leucopenia. There was an increase in the eosinophile count in all except two cases, the range being from 2% to 18%. There was no correlation between the development of the characteristic rash and the peak of the eosinophilia. The average stay in hospital was twenty days from the time treatment was instituted. When it was longer, it was because the patient had signs of active rheumatic fever. The authors consider that "Nirvanol" treatment should be used only in hospital. The stupor which

usually precedes the "Nirvanol" sickness and the reaction itself may be a source of great alarm to the parents.

Infectious Mononucleosis without Clinical Signs or Symptoms.

GERTRUDE REYERSBACH AND T. F. LENERT (*American Journal of Diseases of Children*, February, 1941) draw attention to the occurrence of numerous epidemics of infectious mononucleosis in foundling homes, children's hospitals, schools and colleges. The persons involved in these outbreaks all had symptoms or physical manifestations of some kind. The blood of most of the patients showed a definite increase in the mononuclear elements, in some instances of the abnormal type of lymphocyte considered characteristic of infectious mononucleosis, in others of small lymphocytes without the presence of abnormal cells. The results of the Paul-Bunnell test, which was used in only three of the epidemics reported in the literature, were given as positive in two reports and negative in the third. The authors report 16 cases of an atypical form of infectious mononucleosis occurring in a sanatorium for rheumatic children. The outbreak differs from those previously reported in that none of the children had symptoms or physical manifestations of any kind. The diagnosis was made on the infectious nature of the epidemic and on the basis of the blood picture, which was characterized by a high leucocyte count with a striking increase in apparently normal lymphocytes. The results of the Paul-Bunnell test were uniformly negative.

Effect of Ultra-Violet Irradiation of Air on Incidence of Infections in an Infants' Hospital.

FE DEL MUNDO AND CHARLES F. MCKHANN (*American Journal of Diseases of Children*, February, 1941) have studied the efficacy of ultra-violet radiation as a further means of control of secondary infections arising among infants in hospital. The source of these infections is mostly the personnel of the hospital and visitors rather than fellow patients, and overcrowding in connexion with infections acquired in a hospital must be considered with reference not only to the other patients, but also to the large number of other persons who are permitted to enter the wards. Some diminution in the transmission of organisms was found to follow the masking of all persons entering the ward, but masking, even with a special type of mask, was not sufficient to eliminate secondary infections. A limited experience with ultra-violet radiation gave the following results. While in a control ward the hospital infection rate during the winter of 1939-1940 was 12.5%; in a ward in which conditions were entirely comparable except that each cubicle was protected across the front and across the top by ultra-violet radiation, the cross-infection rate was 2.7%.

Buccal Spots.

ERNST WOLFF (*Archives of Pediatrics*, January, 1941) describes a new physical sign, first observed four years ago, which appears to be helpful in establishing the diagnosis in gripe and the common cold. During the period which has elapsed since that time characteristic changes of the buccal mucosa of the mouth have been seen in some 70% of influenza-like infections in patients ranging in age from fourteen

months to adult years. They have been called buccal spots. The cause of these spots is assumed to be mechanical trauma by the teeth of a mucosa which has become vulnerable in the course of the infection. The spots are always seen in the mid-area of the mucous membrane of the cheek opposite the bite-line of the cheek. In order to observe them the whole buccal mucosa must be examined in a good light. The spots are essentially different from the lesions of traumatic injury, aphthous stomatitis and Koplik's spots. They may be of value in the differential diagnosis of acute surgical conditions in the abdomen, and since they may persist for two or three weeks as scars or petechiae, they are occasionally helpful in explaining states of malaise, fatigue and anorexia following forgotten or subclinical gripe or colds.

ORTHOPÆDIC SURGERY.

Tuberculosis of the Ankle and Tarsus.

W. R. D. MITCHELL (*The British Journal of Surgery*, July, 1940) reviews the histories of 169 patients suffering from tuberculosis of the ankle and tarsus, and discusses the treatment and progress. The majority of these patients were followed up for a period of at least three years after the cessation of treatment. Patients under seventeen years are classified as children. This group is further classified according to the type of disease: (a) extraarticular, (b) synovial, (c) intraarticular. Extra-articular disease is chiefly found as a localized bone abscess in the os calcis, though occasionally in the cuboid or talus. The infection may also be localized as a bursitis, teno-vaginitis or as a superficial abscess. Treatment in the cases reviewed by the author consisted of complete immobilization in recumbency, and the results were good. Clean removal of diseased soft tissues was adopted. One encysted calcaneal focus was cleaned out at operation. The disability in this case extended to forty-eight months, as opposed to thirteen months in similar cases treated by conservative means. Synovial disease affected 10.3% of the total. In this group general decalcification of the foot bones and synovial thickening were present. At no time was any erosion of bone detected. Adequate immobilization in recumbency limited average disability to a period of 10.5 months. In two patients treated intermittently, the duration of the disability was forty-three and forty-eight months. The majority of the group suffered from the intraarticular type of disease. The author notes that the actual site of infection, whether in the ankle joint, subastragaloid or other tarsal joints, had no bearing on the duration of the disease or the resulting deformity. The average duration of the continual immobilization in recumbency was seventeen months. Sinus formation occurred in 71% of cases, but in spite of this, bony ankylosis resulted in only two instances. The author concludes that a sound fibrous ankylosis is no disability, and the teaching that secondary infection of a joint leads to bony ankylosis does not usually apply in the case of the ankle joint. The author believes that no similarity can be drawn between adults and children. The end results in the

45 adult patients followed was disappointing; 27% were able to return to work, and there was no guarantee that the disease was permanently cured. No cure was obtained in patients over the age of forty-two, and the author contends that in elderly patients the disease should be considered as malignant and treated as such. He considers that amputation should be performed without delay on all patients over forty-five years. In adults of seventeen to forty-five years conservative treatment as for children should be followed for six months, and if signs of healing appear, this method should be continued. If at any time progress becomes arrested for more than three months, amputation should be performed immediately. Too long delay in amputation may lead to spread of the disease, including metastatic spread.

Early Operation (Spine Fusion) in Unstable Lumbo-Sacral Joints.

GILBERT E. HAGGART (*The Journal of the American Medical Association*, December 21, 1940) discusses the problem of low back pain. Lumbo-sacral fusion has produced impressive results in younger patients suffering from low back pain, due to unstable lumbo-sacral joints. For the purpose of gaining information the author grouped into two classes all patients with low back pain due to unstable lumbo-sacral joints. The first group comprised older persons who had received conservative treatment over a period of years, one year of which was under personal supervision. The second comprised younger patients, treated by arthrodesing operation. No patient is included in either group with a history or examination indicating herniation of an intervertebral disk. Discussing the etiology of back pain, the writer supports Ferguson's statement that lumbo-sacral anomalies produce symptoms only through faulty mechanics. As long as the muscles and ligaments are of sufficient strength and tone they will enable the person to continue in his environment without fatigue, that is, compensation is present. Decompensation and pain may become evident as the patient grows older and the muscles lose their tone and power. In consequence a person of twenty may have good compensation, but at forty will have insufficient muscle strength to protect the lower part of the back. An unstable lumbo-sacral joint is defined as a clinical entity which includes any arrangement of bony parts at the lumbo-sacral junctions, inadequate for support without undue stress or strain on the adjacent muscles and ligaments. The following mechanical faults are included: unstable lumbo-sacral facets, bone defects in the posterior elements of the lumbo-sacral vertebrae, transitional vertebrae (sacralization and lumbarization) spondylolisthesis, an abnormally acute lumbo-sacral angle, posterior displacement by the fifth lumbar vertebra on the sacrum, and narrowed lumbo-sacral disk following trauma or as the result of faulty posture. The author believes that 95% of patients with chronic low back pain are best treated conservatively. This statement excludes such conditions as tuberculosis, primary neoplasms, fractures, osteitis or herniated disks. Out of 2,000 patients with low back pain seen at the author's clinic, only 2.5% were subjected to arthrodesing operations. These 50 patients belonged to group 2 and had an average age of

thirty-six years. All had received an adequate trial of conservative treatment. Forty-six were relieved of their backache. Seventy-five patients of group 1, with an average age of fifty-two years, had been treated conservatively. In every case there was X-ray evidence of productive bone changes at the unstable articulation. Generalized degenerative arthritis of the lumbar part of the spine was evident in 18 of the 75 patients. These arthritic changes are considered significant, not only as indicating mechanical unsoundness, but as an additional factor in producing symptoms. Such arthritic pain would have been avoided by a fusion operation earlier in life. The author contends that of all effective methods of conservative treatment, rest in bed is the most important. He believes that if patients would follow a regimen of muscle exercise, diet to reduce weight, and bed rest, comparatively slight disability would result. It is difficult to get any patient to follow such a routine for years, and consequently a younger person should be asked to consider a fusion operation after a fair trial of conservative therapy.

The Treatment of Compound Fractures.

JAMES E. THOMSON (*The Journal of the American Medical Association*, November 30, 1940) gives "ten commandments" for the treatment of compound fractures. The object of treatment should be (a) to care for the general condition of the patient, (b) to obtain healing of the bone with the best possible alignment and the least impairment of function, and (c) to prevent or control infection. The author warns the reader that every commandment will not apply to every compound fracture, but judgement and experience will eliminate the unessential. The "commandments", which are meant to furnish a standard set of rules for guidance, are as follows: (1) Splint and immobilize a compound fracture at the scene of the accident, and transport the patient with celerity and great care to an adequately equipped hospital. (2) On admission to hospital make every compound fracture an emergency case, giving the earliest possible adequate treatment. (3) Scrub the limb about and away from the wound for ten minutes with green soap and flowing sterile water. (4) "Débride" every wound thoroughly with proper respect for anatomical structures and close those wounds which experienced surgical judgement seems to justify. (5) Reduce after débridement every compound fracture and firmly fix the fragments in place. (6) Coat the wound with sulphanilamide crystals and give this drug or its derivatives by mouth. (7) Immobilize the limb in a plaster of Paris cast, adequately fenestrated for the observation of the wound and surrounding tissues. (8) Give at once a prophylactic injection of antitetanus serum combined with the *Bacillus welchii-perfringens* serum. (9) Give a prophylactic dose of X rays twice a day for three or four days over every compound fracture. (10) Use pectin therapy in all superficial open wounds. The author includes a table showing the results obtained by the application of these principles in 49 patients. Among 35 patients there was 10% or less disability for occupation, in ten cases the disability was between 10% and 20%, and in four cases the disability was 20% or more.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on May 1, 1941, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney. Dr. WILFRED VICKERS, the President, in the chair. The meeting took the form of a symposium on urological subjects, a series of short papers being read.

Rupture of the Urethra.

Dr. J. W. S. LAIDLEY discussed rupture of the urethra. He said that the condition was a fairly common accident involving the male in youth and middle age. Generally the trauma was caused in one of two ways: (i) By the classic method of falling astride some sharp edge, such as a paling fence. By this means the urethra might suffer any degree of injury from contusion to complete division. It was, as it were, divided by a pair of blunt shears, the lower blade being the edge of the paling fence and the upper blade the lower edge of the arch of the pubes. (ii) By an accident involving fracture of the pelvis, a common cause of rupture of the urethra. The pubic bones might be dislocated at the symphysis and might tear the urethra across. Dr. Laidley said that that type of rupture might be extremely difficult to deal with, because the two severed ends of the urethra might be separated in zig-zag fashion by the dislocated bony fragments.

The classic signs of traumatic rupture of the urethra were (i) perineal bruising, (ii) blood issuing from the urethral meatus and (iii) retention of urine. Dr. Laidley said that he particularly wished to speak about the treatment of the condition. If a patient was allowed to wait for some hours, striving to pass urine through a ruptured urethra, extravasation of urine in the perineum would inevitably occur. This extravasation would lead to the formation of a large amount of scar tissue, and the ultimate result would be a tortuous resilient stricture that would need dilatation at frequent intervals. Dr. Laidley regretted that that was a far too common sequel to a ruptured urethra. He suggested that a ruptured urethra should be regarded as a surgical emergency, which should be dealt with as rapidly as possible in an operating theatre and under general anaesthesia. The first thing was to make sure that the lesion was a rupture and not a mere contusion; the insertion of a soft rubber catheter would decide this question. If a soft rubber catheter refused to pass into the bladder, one could be sure for all practical purposes that the urethra was ruptured. The urine should then immediately be diverted by means of a suprapubic cystostomy. Once this had been established, the patient was safe; no perineal extravasation of urine would occur. The blood clot would absorb in a few days, and then, and not till then, should attempts be made to restore the continuity of the urethra. Dr. Laidley said that he did not propose to discuss the treatment any further. His purpose had been to attempt to urge upon those present the real necessity for a rapid diversion of the urine in these cases. Not only might a cystostomy possibly mean life instead of death to the patient, but it would certainly mean a reasonable ultimate result instead of the condemnation of the unfortunate victim to a life of misery.

Prostatitis.

Dr. A. C. TELFER discussed prostatitis. He said that when talking of prostatitis one immediately thought of frequency of micturition, scalding and pain at the end of the act—a local expression of posterior urethritis. Prostatitis could exist, however, without these localizing symptoms. Unfortunately, too, it was commonly thought of as being only of venereal origin. Its origin might be in some other part of the urinary tract or in some distant septic focus, and might not be venereal.

With the advent of sulphanilamide, posterior urethritis and consequently prostatitis in acute gonorrhoea were nowadays much less severe. Active treatment of this complication should be on the most conservative lines. If dysuria became very pronounced, gentle catheterization might have to be performed. The prostate should be felt *per rectum* for diagnosis only, and not massaged. Only rarely nowadays was acute gonorrhoeal prostatic abscess seen; in such cases perhaps an incision through the perineum might have to be made.

Acute prostatitis of metastatic origin was more frequent, and it was dangerous because it was sometimes overlooked. Teeth, tonsils and furuncles were generally believed to be the most usually associated primary foci. Less frequently

the gall-bladder, intestines and infections, especially influenza, had been indicted. However, acute metastatic prostatitis might occur without any evident primary focus. There were two types of metastatic prostatitis, the type associated with urinary symptoms and the type in which there were no urinary symptoms, but the symptoms and signs were constitutional—a general malaise and an unexplained elevation of temperature. The treatment of this type of acute prostatitis was by chemotherapy and massage. The massage should be done gently, and any reaction, either local or constitutional, should be taken into account. Sometimes this metastatic variety went on to abscess formation. With encroachment into the posterior part of the urethra the patient's bladder might have to be catheterized. Judgement was necessary in the making of a decision as to whether the abscess should be incised; but with increasing urinary difficulty and a continued constitutional reaction there should be no hesitation in incising the abscess by the perineal approach.

Dr. Telfer went on to say that the importance of remembering the possibility of chronic prostatitis could not be too strongly emphasized. Unless the symptoms were pronounced, this cryptic focus was apt to be overlooked. As in acute inflammation, the origin might be venereal or non-venereal; it might be in an old almost forgotten venereal infection or in the distant foci mentioned. Chronic prostatitis might be grouped under two headings, (i) chronic prostatitis with local symptoms, and (ii) chronic prostatitis with remote symptoms. The local symptoms might be inflammatory, obstructive or sexual. Discussing inflammatory symptoms, Dr. Telfer said that pain at the end of micturition, frequency of micturition and sometimes hæmaturia were the most usual. Another common story was one of recurrent attacks of urethritis and a persistent gleet. Bladder and renal infection following prostatitis, and on the other hand prostatitis following stricture and infection of the upper part of the urinary tract, reminded the urologist of the importance of considering the uro-genital tract as a whole and of the need for examining the lower part of the tract before proceeding with examination and perhaps instrumentation of the upper part. Too often had a patient's condition been labelled "pyelitis" or "cystitis" without adequate examination of the prostate. A urethral stricture was often successfully treated by gradual dilatation, while a forgotten prostatitis was left to give the patient frequency of micturition and scalding and irritation. With regard to obstructive symptoms, Dr. Telfer said that chronic prostatitis which produced obstruction with its symptoms, such as the need to pass urine at night, a dribbling, poor stream *et cetera*, was difficult on superficial examination to differentiate from other bladder neck obstructions. Adenoma of the prostate and median bar could be excluded by cystoscopy. One had also to bear in mind the not uncommon association of adenoma and chronic inflammation. There was a special need for instrumental examination of these patients with urinary obstruction. With regard to sexual symptoms, Dr. Telfer said that an unfortunate and little understood group of patients had predominantly sexual symptoms. Premature ejaculation, impotence, sterility and sexual neurasthenia were merely a few of a whole host of sexual symptoms which confronted an ignorant medical world. Sterility in the male was a most complex subject; but these people should at least have their prostatic and vesicular fluid examined for infection. Sometimes in the "sexual neurasthenic" one had to recognize a double lesion—the infection and the psychic disturbance. Cure of the infection did not always relieve the patient completely, but it often produced amelioration of his symptoms.

Dr. Telfer then referred to chronic prostatitis with remote symptoms. He said that it was when the symptoms were not referable to the urinary tract that prostatitis might be overlooked. Vague referred pain, especially in the lower lumbar and the perineal regions, often had its origin in prostatitis. In the so-called "focal infective" group of patients the prostate could act as a breeding place for infection, which was carried by the blood to joints, tendons, muscles, bones and eyes. The infected genital tract was a dangerous factor in focal sepsis, not because of the great frequency of infection at that site, but because less thought and consideration were given to it. Interesting figures from the Cleveland Clinic showed that approximately 41% of patients with joint symptoms referred by the orthopaedic department for genito-urinary investigation had prostatitis. To Wesson's clinic in San Francisco were referred all patients with injuries to fibro-muscular tissues, joints and back. It was stated there that investigation for and treatment of prostatitis had considerably reduced the period of disability of workers. Finally, in this group of patients with symptoms not obviously referable to the uro-genital tract there was the man who had a chronic abscess and who had an intermittent, otherwise unexplained rise of temperature for weeks. Dr. Telfer remembered such a

man, aged sixty years. He had no history of previous urethritis, and dramatic recovery in three weeks followed the discovery and treatment of a silent chronic prostatic abscess.

Dr. Telfer went on to discuss the diagnosis of chronic prostatitis. He said that the diagnosis was made by examination of the urine, of the prostate *per rectum*, of the prostatic secretions and of the posterior portion of the urethra by endoscopy. The practised urologist, feeling an enlarged prostate *per rectum*, would probably be able to differentiate between adenoma, cancer and tuberculous and non-tuberculous prostatitis. It was sometimes difficult, however, to differentiate between chronic prostatitis and hyperplasia. In the attempt to obtain a prostatic bead for examination, the prostate should not be massaged too vigorously just because no bead appeared at the urethral orifice. Two things might have happened: the prostatic fluid might have been expressed into the bladder (and an examination of a specimen of urine passed after the massage would reveal this) or drainage was as yet inadequate. It was only after gentle massage on three occasions at intervals of four days at least that sometimes a prostatic bead was obtained. No negative report should be given until the third examination. Dr. Telfer emphasized the importance of examination of a wet film. The collection of the specimen on a slide, the placing of a cover slip and the adjustment of a microscope for high power did not take too much time, and with a little experience much could be gained from the examination of unstained fluid. The progress of the infection could be watched by the decrease in the number of pus cells, by the presence of leucithin crystals, and perhaps by the diminution in the number of degenerative cells and of those products of stasis, the so-called *corpora amylacea*. If a diagnosis of chronic prostatitis was made and there was no response to treatment or if the examination was inconclusive, an inspection of the posterior portion of the urethra and the bladder neck should be made. Sometimes the endoscopic picture would be the only clue to a low-grade infection. Mucous polypi and granulomata at the bladder neck and near the verumontanum, trigonitis and sometimes diffuse cystitis might exist in chronic prostatitis.

The picture of dilated prostatic ducts with pus welling up was a familiar one to the cystoscopist. Dr. Telfer stressed again the importance of inspecting the posterior portion of the urethra when the symptoms were obstructive.

Discussing treatment of chronic prostatitis, Dr. Telfer said that it should include (i) general health measures, particularly the absolute abstinence from alcohol, (ii) the elimination of septic foci, (iii) the establishment of adequate drainage by massage, (iv) chemotherapy, and (v) instrumentation and local applications. Prostatic massage was the sheet anchor of treatment. It should be done gently and no more frequently than once every four days. If there was any retrogression during treatment an inquiry would usually elicit confession of a lapse in general health or habits—particularly alcoholic habits. Gentle massage should be continued until a normal prostatic bead was seen. Dr. Telfer said that in massaging the prostate he remembered the word "tone"; he was trying to increase the tone of a muscular organ and not trying to push material out of a sac. The identification of the organism by culture was the ideal approach to any chemotherapy. Other than placebos there were only two useful types of drugs—the sulphanilamides and the arsenicals. For staphylococcal infections three or four intravenous injections of "Neosalvarsan" often gave dramatic results when all else had failed. Dr. Telfer had had no experience with sulphathiazole in prostatitis, but thought that it might prove useful in staphylococcal infections. In general, hygiene, the removal of septic foci and prostatic massage would be sufficient treatment for most chronic infections. It was surprising sometimes how immediate was the patient's relief after even the first massage. Urethrosopic catheterization, cutting and diathermy of the prostatic ducts, transurethral resection, injection of antiseptic fluids directly into the prostate, and injection along the *vas deferens* had their advocates. No general rule could be laid down about any of these procedures, but Dr. Telfer thought that some of the applications and treatment given transurethrally might be of use in selected cases and when performed by a skilled urethrosopist.

Immediate Relief of Urinary Retention.

DR. KEITH KIRKLAND discussed urinary retention. He said that it occurred as a result of lesions of the urethra and bladder neck, abnormalities of the bladder contents, such as blood clots, an upset in the neuro-muscular unit underlying the act of micturition, or a combination of some or all of these causes. He proposed not to deal with the condition as a post-operative complication. A brief consideration of the age and history of the patient would point to the most likely reason for retention of urine.

In the urethra the commonest pathological condition was stricture. Relief should be attempted by penetration and dilatation of the narrow area or areas. If with all gentleness, urethral anaesthesia and free lubrication, a metal sound or gum-elastic bougie could not be passed, an attempt with soft gum-elastic filiforms should be made, and if it was successful a follower for dilatation or catheterization should be screwed on. Whalebone bougies were too dangerous to be considered. Dr. Kirkland always used an anaesthetic lubricant in these circumstances, as also in cystoscopy; he did not believe that efficient lubrication for the full extent of the urethra could be obtained by the mere dipping of any instrument in lubricant. Perseverance at penetration should not be too courageous; there were nearly as many false passages as there were strictures of the urethra, and Dr. Kirkland had frequently found at operation the urethral orifice so remote from the blind end of the false passage that no manipulation could have been successful. If relief *per urethram* was not possible, suprapubic cystostomy had to be performed. Various methods had been described, but Dr. Kirkland believed that the orthodox operation, with an incision of at least two inches and drainage of the bladder as far from the pubic bone as possible, was the easiest, quickest and safest. Suprapubic puncture was a most reprehensible procedure and should never be carried out when even the crudest operative facilities were available. There was always a risk of puncturing the peritoneum, but the danger of suprapubic cellulitis was even greater. If cystostomy was impossible and puncture was performed, the needle should not be removed until the bladder was opened, and that should be at the earliest opportunity. It was quite obvious that if a bladder was punctured and if the obstruction was not removed before the needle was taken out, the patient's attempts at micturition would force urine into the prevesical tissues. Dr. Kirkland stressed again the absolute importance of gentleness in any manœuvre related to the urethra. If force had to be used it was certain that the wrong thing was being done. Actually haste generally meant force. Dr. Kirkland remembered once asking Swift Joly what he thought to be the best urethral anaesthetic; he had replied: "The experience of having passed a thousand sounds." Incidentally, Dr. Kirkland was absolutely opposed to the use of several sounds at the one sitting. If one sound was passed and a stricture was stretched most benefit would result if no more was done. When insulted by rough treatment a urethra reacted by fibrous tissue formation.

In the bladder neck a diseased condition of the prostate gland was the main cause of retention of urine. In the average case due to hyperplasia or carcinoma, catheterization presented no difficulties. A coude or bicoude catheter of rubber or gum elastic was more useful than a straight catheter. If this measure was not successful, a catheter threaded on an introducer bent to full prostatic or Béniqué curve would generally serve. Occasionally a metal catheter achieved the object better. Rarely, when all these methods failed, recourse had to be had to cystostomy. The question of sudden or gradual emptying of the bladder arose. Immediate withdrawal of a large quantity of urine from the bladder of a patient in whom a condition of chronic retention of urine had culminated in sudden stoppage, had long been considered. Donald Creevy, of Minneapolis, in 1938, analysed the results in two series of cases, one in which drainage was sudden and the other in which it was gradual, and concluded that there was no difference. Although for years Dr. Kirkland employed gradual decompression, he confessed that he could not recall any case in the many he had encountered in which trouble occurred when all the urine was withdrawn immediately.

Dr. Kirkland then said that occasionally prostatic abscess caused acute retention of urine. Relief might be obtained by the injection of morphine and a hot rectal wash. If not, it might be possible to rupture the abscess into the posterior portion of the urethra when urination became possible. Finally, a small catheter should be gently passed if relief was not achieved otherwise. With regard to the bladder contents, stone rarely and blood clot more commonly would cause retention of urine. Dr. Kirkland had not encountered a case of impacted stone either at the bladder neck or in the posterior portion of the urethra in which catheterization was not possible. A soft rubber catheter was generally useless in retention of urine due to blood clot, as suction by a syringe made its walls collapse. A.C.M.I. had recently introduced a harder rubber catheter, which became softened when boiled and could be easily introduced. The walls were semi-rigid when it cooled and did not collapse when strong negative pressure was applied. A metal catheter, a resectoscope sheath or a litholapaxy cannula was satisfactory, and rapid removal of a clot could be carried out by an attached syringe or by an Ellik or Bigelow evacuator. Retention of urine due to neurological lesions could be easily relieved by catheterization.

With regard to female patients, Dr. Kirkland said that two causes of retention of urine were common: stricture of the urethra and distortion of the bladder neck and the urethra by pressure from pelvic tumours. It is rarely that a stricture was difficult of penetration; but Dr. Kirkland had had to use filiforms with a follower and had even been unable to pass very small sounds or catheters without the guidance of a filiform. Little or no difficulty was encountered in relieving retention of urine in the second group of cases. Catheterization was sufficient; the catheter should be left in and continuous drainage instituted. It went without saying that all urethral manipulations should be carried out with an absolute observance of aseptic principles. A patient with retention of urine was to be regarded as being very ill indeed, so that the introduction of foreign infection was quite sufficient to tilt the balance against him or her.

Renal and Ureteric Calculi.

Dr. R. H. BRIDGE discussed renal and ureteric calculi. He said that the association of severe pain with calculi was so common that one was apt to forget that a calculus could be completely painless or that the pain could be mild, anomalous and quite unobtrusive. Rarely during routine X-ray examination of the abdomen shadows were detected which on further investigation proved to be due to calculi in the kidney or ureter. These calculi were completely symptomless, owing to the fact that they had produced no obstruction, infection or hæmorrhage. Dr. Bridge had seen in the kidneys and ureters calculi of large size that had caused no symptoms at all.

Dr. Bridge went on to speak of calculi associated with mild, anomalous or obscure pain. He said that all calculi did not produce the classic text-book type of pain or colic, and he mentioned some of the more common variations. The pain might be merely a dull backache ascribed to rheumatism. A renal calculus on the right side might simulate very closely gall-bladder pain. A ureteric calculus might simulate appendiceal pain or the pain of colonic diverticulitis. The pain might be merely a dull ache in the testis or vague pain might be present in the upper or lower portion of the abdomen, quite unlike the classical picture of renal or ureteric colic.

Dr. Bridge then said that a calculus might announce its presence with no pain or pain of an extremely mild character, but with obvious signs of disease of the urinary tract. The first such sign was hæmaturia. Calculus remained the commonest cause of hæmaturia, which might be very pronounced and might be the only symptom. The same applied to pyuria; Dr. Bridge had encountered numerous cases of unexplained symptomless pyuria and hæmaturia which proved to be due to calculus. Persistent cystitis might be due to an infected calculus-bearing kidney. On more than one occasion Dr. Bridge had found the onset of a severe perinephric abscess to be the first manifestation of calculus. From all these points a most important lesson was to be learned: in every case of urinary tract disease, no matter how mild, an X-ray examination should be made; preferably, excretion urography should be carried out as well.

Dr. Bridge then referred to the causes of calculus. He said that when it had been determined that there was a calculus in the urinary tract some attempt should be made to find a cause for it. The chief constitutional causes were cystinuria, parathyroid tumour, vitamin deficiency and disturbances in uric acid metabolism. Dr. Bridge merely touched on the local causes of calculus, making special reference to Randall's work. He then pointed out that calculus formation might be only an incident in some other much more important pathological condition. An example of this had occurred in a case to which he referred, in which "stone in the pelvis of the kidney" was really calcification around a piece of hydatid membrane; a hydatid cyst was found in the lower pole at operation. Other cases in which a calculus might be merely secondary to an underlying disorder were: (i) calculus in a tuberculous kidney, (ii) calculus in a horseshoe kidney, (iii) calculus incidental to ureteral stricture, to hydronephrosis, to obstruction at the uretero-pelvic junction, to ureterocele *et cetera*. Dr. Bridge pointed out the second lesson to be learned, namely, that no diagnosis of calculus was complete unless one knew (a) the constitutional state of the patient, (b) the bacteriological condition of the urinary tract, and (c) the anatomical state of the urinary tract.

Dr. Bridge then discussed the diagnosis of calculus from these points of view. He dwelt at length on excretion urography and referred to some essentials of cystoscopy. He then referred briefly to the treatment of calculus. He said that small calyceal calculi should not be surgically removed unless they were causing severe hæmorrhage or maintaining infection, as the risk of operation was great. After the removal of renal stones nephrostomy should be performed to allow the escape of blood and infected urine

and to allow the application of medicaments to the infected renal pelvis and calyces. The higher a calculus was impacted in the ureter, the more one should think of operative removal rather than of cystoscopic manipulation. Finally, when operation had been decided upon, the patient should be radiologically examined immediately before going to the operating theatre; calculi had tricky habits, and might move up or down when least expected to do so, and if such an X-ray examination was made as a routine measure, much humiliation would be spared the surgeon.

Pyuria.

Dr. R. G. S. HARRIS discussed pyuria. He said that the passage of urine containing pus was a sign, and a sign only, of bacterial invasion of the urinary tract. It was not a diagnosis. That fact appeared to be self-evident, but it was only too frequently overlooked, and treatment was aimed solely at the clearing of the urine. When a rapid response was obtained to medical treatment, the episode was forgotten; an attack of "pyelitis" (or of what sounded more impressive, "pyelocystitis") had been repulsed. Recurrences were treated on similar lines, and so long as reasonable symptomatic relief was obtained, no further investigation was suggested. In his opinion and from his experience, the so-called diagnosis of "pyelitis" had been largely responsible for the development of hydronephrosis and pyonephrosis, solely because of neglect in investigating the cause of recurrent attacks of pyuria. For years he had refrained from using the word "pyelitis" and had banned its use by his resident medical officers. So common and so loose had become the general use of the term "pyelitis" that a home-made diagnosis and a demand for a bottle of medicine were frequently presented to the medical practitioner. Dr. Harris did not believe that such an entity as infection and inflammation of the renal pelvis *per se*—"pyelitis"—could occur. A combined pyelonephritis was the rule, and such should be the diagnosis. If that term were generally adopted, the potential danger of the infection would be appreciated and a search for the underlying cause would be energetically pursued.

Dr. Harris went on to say that pus in the urine might have its origin in the upper or lower portion of the urinary tract. When the infection was renal, or when the free drainage from the kidney was obstructed, as by ureteric obstruction from whatever cause, lumbo-abdominal pain was usual and costo-vertebral tenderness was found on examination. Hæmaturia frequently accompanied pyuria when calculus was the causal factor, and it was not uncommon in association with infected hydronephrosis. Frequency of micturition and scalding were common symptoms. In the acute stage a rise of temperature up to 105° F., accompanied by rigors, aided in the differential diagnosis from appendicitis. The immediate treatment consisted in the hypodermic injection of morphine and atropine to relieve pain and to give the patient rest. It had to be borne in mind that morphine increased the peristaltic movements of the pelvis and ureter, as it did those of the bowel, and for that reason it should generally be combined with atropine, which inhibited peristalsis. The majority of acute symptoms would yield to the administration of alkalis and of sulphanilamide; "M & B 693" (sulphapyridine) should not be used, as it was no more effective, was certainly more toxic and was considerably more costly. If symptoms and signs did not completely abate within a reasonable period (from one to four weeks), or if there was a recurrence of any degree, further investigation had to be carried out. A catheter specimen of urine was examined and the infecting organisms were identified. According to the report obtained, the continuance of sulphanilamide and alkaline therapy or the change over to mandelic acid and acid therapy would be indicated. Next, an excretion urogram should be taken. Dr. Harris considered this to be of the utmost importance, for on the result obtained depended the planning of all future treatment. Hydronephrosis due to varying types of ureteric obstruction was revealed, and this led to complete urological investigation (cystoscopy, pyelography *et cetera*). In the absence of obstruction, the finding of pyelonephritis led to further chemotherapy and an energetic search for a focus of infection as the primary cause of the condition. Before a complete cure could be claimed, the urine had to be proved to be sterile. The cessation of treatment before sterility of the urine was attained was a frequent cause of relapses and of recurrent attacks.

Dr. Harris went on to say that chronic pyelonephritis was frequently associated with some degree of ureteritis; this resulted in varying amounts of ureteric obstruction, as was demonstrated by an irregularly tortuous and dilated ureter. This lack of free drainage furthered the chronicity of the renal infection and was a predisposing factor to calculus formation. Gradual dilatation of the ureter with Braasch

bulbs was the treatment indicated, in addition to the previously mentioned chemotherapy and the search for and eradication of the focal infection. When the infection was confined to the lower portion of the urinary tract, pyuria, associated with strangury, frequent and painful micturition, urgency of micturition, and hæmaturia, were quite common. Suprapubic pain or discomfort, low backache and perineal uneasiness of varying degrees were frequent symptoms; pyrexia was variable. A differential diagnosis included cystitis, seminal vesiculitis (sometimes the cause of intense pain simulating ureteric colic), prostatitis and urethritis. In women skenitis was a frequent cause of recurrent attacks of frequent and painful micturition with intermittent pyuria. In this condition also, in addition to the use of sedatives and chemotherapy, and in the acute stages alkalis and sulphanilamide, a search for the underlying focus of infection should be instituted. Active treatment should be withheld until the acute symptoms had subsided. The infecting organism should be sought and the appropriate therapy prescribed. Chronic vesiculitis and prostatitis also required rectal massage over a prolonged period, at regular intervals up to six months, to complete a cure. Septic teeth, which were frequently the original foci of the infection, might delay the completion of a cure until their removal was effected. Skenitis in women, diagnosed by redness and dilatation of the orifices of the ducts and by the typical fullness and thickening of the posterior lip of the urethral orifice, was treated by destruction of the ducts with the diathermy current.

Dr. Harris then referred to post-operative cystitis. He said that this was caused by incomplete emptying of the bladder and infection of the residual urine. In every case in which retention of urine or difficulty in passing urine was noted after operation, he considered it most important that one or two tests on successive days should be made to guard against the presence of residual urine. Should residual urine prove to be present, catheterization should be carried out night and morning after voluntary micturition, and instillations of silver nitrate once daily were a most effective form of treatment. Treatment should be continued until the residual urine was reduced to less than half an ounce. "Prostigmin" appeared to act very efficiently in preventing the onset of the condition in most cases. In conclusion, Dr. Harris stressed the fact that, as with hæmaturia so with pyuria, neglect to make a complete investigation and to diagnose and to eradicate the underlying disease at the earliest favourable opportunity was followed by the gravest consequences.

Hæmaturia.

DR. COLIN EDWARDS dealt with hæmaturia. He said that although hæmaturia was discussed practically every year, the seriousness of the symptom was not yet appreciated by either patients or practitioners. Thus in 20 consecutive referred cases the average time since blood was first observed in the urine was thirteen months. Urologists could do little about the procrastinating patient; but they might be permitted to point out to the physician that if a precise diagnosis could not be established in a reasonable time, then a urological examination should be carried out at once.

Dr. Edwards said that he did not propose to enumerate all the diseases of which hæmaturia was symptomatic. The safest rule in diagnosis was to regard every case of hæmaturia as due to tumour until the contrary was proved. If this was accepted, then the role of the physician was immediately limited to the exclusion of certain causes of hæmaturia. First there were the general systemic diseases, such as hæmophilia, leucæmia and purpura; the acute fevers, arteriosclerosis and deficiency of vitamin C; also the ingestion of certain drugs, such as turpentine, potassium chlorate and sulphapyridine. Secondly, diseases of adjacent viscera, such as pelvic abscess, acute appendicitis and salpingitis, should be considered. Finally, there were certain urological diseases susceptible of clinical diagnosis—for example, urethritis, prostatitis, caruncle, acute cystitis and crystalluria. Two of these conditions had come into prominence lately because of recent discoveries. The first of these was hæmaturia due to excretion of crystals of the sulphonamide group of drugs. This was much more prone to occur with sulphapyridine and sulphathiazole than with sulphanilamide. It was a definite indication of damage to the epithelium of the urinary tract and a no less definite warning of impending calculus formation. The prophylactic treatment consisted simply in the ingestion of large quantities of water; at least five pints a day were required to keep the non-conjugated portion of the drug in solution when high blood concentrations were maintained. When hæmaturia occurred the drug should be discontinued (at least temporarily) if the patient's condition permitted, the fluid intake should be increased and alkalis should be

given. If blood continued to appear in the urine, radiographic examination for calculus should be made at once. Provided that it was discovered early, treatment of the established calculus of sulphapyridine was less radical than the treatment of those of other chemical composition, as it remained fairly soluble in its early stages. Later, when the usual stone-forming crystals had accrued, the calculus had to be treated as one of the common varieties.

Dr. Edwards went on to say that the second condition which had attracted recent attention was deficiency of vitamin C. Only two such cases had come under his notice; one patient was an obviously under-nourished child and the other was a man, who stated that he had lived for two years on a diet prescribed for gastric ulcer; this patient had a mild degree of scurvy. Both responded well to the ingestion of the juice of six oranges a day, and subsequently thorough investigation failed to reveal any lesion of the urinary tract. It appeared, however, that many persons were continually deficient in vitamin C, the principal clinical evidence being mild gastric disturbance. Estimation of the daily excretion of vitamin C in the urine, with and without test doses of ascorbic acid, could be used to establish the diagnosis; but in treatment orange juice had two advantages: it was given orally and was palatable, and it contained vitamin P, which was a useful adjuvant. The disadvantage was that accurate dosage was impossible, owing to the varying content of vitamin in orange juice. In conclusion, Dr. Edwards strongly urged those present to make an early and earnest attempt to establish a definite diagnosis when such patients presented themselves. It was a grave error to put the patient to bed, give him a sedative mixture and make light of his troubles when the bleeding ceased. Such a course not only lost valuable time but also fostered in the patient a belief that investigation was unnecessary. It was advantageous to carry out cystoscopy while blood was still present in the urine, since the source was more readily discovered and the patient's mental outlook was more favourable. Nature may not give any further warning for many months, when investigation often only proved the futility of treatment.

DR. R. J. SILVERTON congratulated the speakers on their papers. He said that they had been very much to the point without too much academic detail, and some had included mention of modern researches. Speaking of ruptured urethra, Dr. Silverton said that he was in entire agreement with the opinions that had been expressed by Dr. Laidley on the subject of early cystostomy. Years of suffering after rupture of the urethra could be saved if early deviation of urine was made and operation on the urethra delayed for a few days. However, in some favourable cases he had chosen to operate at once and to find the divided ends of the urethra and bring them together, and he had not had cause to regret his action. With regard to Dr. Telfer's remarks on prostatitis, Dr. Silverton said that the subject was one of the urologist's bugbears, as was obstinate cystitis in women. Referring to prostatic abscess, Dr. Silverton said that the best method of incision and evacuation was by the perineum, an open approach being used so that a finger could be inserted, loculi could be broken down and a small drainage tube could be put in on each side. The urethral method was not to be despised; it was Nature's method, and Nature often achieved an absolute cure if the opening was large enough. The method to which Dr. Silverton referred was the use of the modern McCarthy endoscope for diagnosis and the McCarthy resectoscope for the removal of tissue from the walls of the urethra, so that the cavity could be opened up. It was extremely difficult to differentiate between prostatitis and carcinoma. The doubt could be cleared up by endoscopy, with the removal of a piece of tissue for biopsy.

Referring to chronic abscess of the prostate, Dr. Silverton said that urethrography was useful. For this purpose he used "Neohydriol", a May and Baker product. This was a very fluid form of iodized oil that was useful in these conditions. Dr. Silverton then referred to the use of sulphathiazole in treatment. He said that he had given it a short trial. He agreed with the American writers, that for general purposes, in the urinary tract at least, sulphathiazole seemed likely to be the most efficient sulphonamide yet known. Supplies of the drug for private use had ceased, and Dr. Silverton used acetyl sulphanilamide, "Albucid"; it was not so toxic as sulphapyridine or sulphanilamide, and was a useful urinary antiseptic.

Dr. Silverton then referred to Dr. Kirkland's remarks on urinary retention and to urethral anaesthesia in the treatment of urethral strictures. Dr. Silverton preferred to avoid anaesthesia in order to avoid doing any harm; he said that perhaps this was to take undue care. With regard to suprapubic puncture, Dr. Silverton said that it was no doubt wrong to use it; but for the general practitioner, surely it

was in some cases quite safe to perform suprapubic puncture with a trochar and cannula if the bladder was over-full and to leave the cannula in the bladder. The measure gave relief until help had been called, and bougies could be inserted through the urethra when acute congestion had subsided. In retention of urine due to prostatic obstruction, a coude catheter was nearly always useful; but Dr. Silvertown had found in some of the most difficult cases that one little instrument almost never failed. The instrument was a number 9 or 10 French coude silk-wove catheter. With regard to the sudden emptying of the bladder, Dr. Silvertown said that he had seen bleeding and renal failure follow this procedure. He now removed only half a pint of urine, put in a spigot and catheter, and instructed the nurse to remove eight ounces every hour.

With reference to Dr. Bridge's remarks on calculi and on the vagaries of pain as a symptom, Dr. Silvertown said that he had a patient at the Prince Henry Hospital whose only symptom was intense pain in the corresponding testis, which woke him up at night on two occasions. In regard to the possibilities of getting stones to pass through the ureter, Dr. Silvertown thought that most of them could be induced to travel down by very gentle and intermittent dilatation of the ureter. He had recently seen a stone 1.5 centimetres in diameter that had travelled down the ureter. With regard to Dr. Harris's remarks concerning pyuria, Dr. Silvertown said that skenitis as a cause was often overlooked. *Trichomonas vaginalis* vaginitis was very commonly associated.

Dr. Silvertown then suggested that some day the British Medical Association ought to consider the question of an exhibition in Sydney in which diseases would be described clearly. In America they had found it best to have actual specimens and not drawings and diagrams. With regard to hæmaturia, Henry Wade, of Edinburgh, had said when he was in Australia in 1935 that if there was not a definite and patent cause for the hæmaturia, a full investigation of the urinary tract should be undertaken with bilateral retrograde pyelography.

DR. CLYDE DAVIS said that he spoke as a general practitioner who practised urology as well, and he wished to ask one or two questions. One or two points had not been stressed. With regard to prostatitis, Dr. Telfer had discussed the subject very well indeed, and it was a subject that should be stressed to the extreme to the general practitioner. Many patients complained of vague abdominal pain for which no cause could be found. If general practitioners would only treat these patients by massaging the prostate, they would clear up many of these cases. In examining a slide for cells one was apt to notice at first a number of large cells and to regard them as pus cells, when they were not. Dr. Kirkland's remarks about retention of urine were very instructive. Dr. Davis had found one small tip useful on occasions: when difficulty was experienced in inducing a catheter to pass through a stricture, if a little water was injected through the catheter, the catheter floated through the stricture. Dr. Kirkland had mentioned strictures in female patients; in fact, he had rather laid stress on the point that extreme strictures occurred in females. Dr. Davis said that many females had residual urine without having a cystocele, and dilatation of the urethra would cure that, and with it their pain. With regard to the question of sudden emptying of the bladder, Dr. Davis agreed with what Dr. Kirkland and Dr. Silvertown had said, that it was necessary to be careful and empty it very slowly; but he thought that all those present would remember cases in which they had removed as much as three pints of urine and nothing had happened. Dr. Davis agreed that suprapubic cystotomy should be used for acute retention of urine in which nothing could be passed through the urethra. By opening the bladder low down, emptying it of an appreciable amount, then closing the opening and performing suprapubic cystotomy, one could make the incision higher up in the bladder and in the correct position. Dr. Davis referred to the fact that pain in the right and left iliac regions was often mistaken for appendicitis, whereas the pain was often due to ureteric constriction. The constriction could be dilated, and this procedure would give the patient a great deal of relief. Dr. Davis then asked for Dr. Bridge's opinion as to what could be done for patients who passed enormous quantities of phosphates and whose urine could not be rendered acid. Dr. Edwards had stressed the importance of a thorough investigation of the urinary tract of patients who had an attack of hæmaturia; Dr. Davis pointed out that it was very difficult for the general practitioner to persuade such patients even to visit a urologist.

DR. D. G. MAITLAND thanked the speakers for their papers. Dr. Bridge had mentioned that "at least a plain X-ray film of the urinary tract should be taken". Dr. Maitland, in agreeing, said that such a film was essential in many cases

of stone and other more obscure conditions; but to be satisfied with a plain X-ray film of the urinary tract was just like asking for a plain X-ray film of the gall-bladder, in which only 4% of stones were visible. To make a plain X-ray examination of the urinary tract was insufficient; but a great deal of information was obtained by the use of the excretion method. Sometimes the complete story could be obtained in that way. The cause of pyuria could sometimes be ascertained by the excretion method of radiography. It was possible to differentiate between stones and concretions in the tip of the appendix, calcified glands, and so on. Pyuria was often present as well; but an excretion pyelogram would show the stones to be outside the urinary tract, and a barium meal would localize them to the appendix. Dr. Maitland had come across a case in which stones seen in the plain skiagram were thought to be of urinary origin; they proved to be a series of small gall-stones in line over the right sacro-iliac joint.

Dr. Maitland expressed the hope that his following remarks would not tread on the corns of any members of the Section of Urology present. He said that urologists depended upon the services of X rays and the radiologists more than other specialists. But there were certain conditions that arose and might be puzzling to the urologist. For example, a carcinoma of the prostate might be present, and metastatic deposits in the bones might be indistinguishable from Paget's disease. Pain again might be referred to the renal region. Dr. Maitland recalled a case in which it was thought that a renal calculus was present; an excretion pyelogram revealed a perfectly normal renal tract, but there was an early tuberculous lesion between the second and third lumbar vertebral bodies. Thus there were conditions that might be missed during the X-ray investigations if one concentrated entirely on the urinary tract and was not experienced in general radiological diagnosis.

DR. C. R. SIM said that he had found the papers very interesting. He said that many patients were sent to him just after an attack of acute renal colic, with the request that he take plain skiagrams and excretion urograms. In many cases the plain films showed nothing of importance and the urograms showed no obstruction in either ureter, or else they showed practically no shadows whatever in one kidney. Dr. Sim thought that perhaps a small calculus had passed and had caused a degree of spasm. The point he wished to make was that the radiographic examinations had been carried out too early after the attack of acute renal colic. Dr. Sim's policy was to take a plain X-ray film and then wait for a week before taking an excretion urogram. He believed that the cause of the acute renal colic in these cases was a small calculus. Dr. Sim then said that he had been fortunate enough to find a ureterocele; it was revealed by an excretion pyelogram. There was no stone in the ureterocele. Dr. Sim then referred to cases in which stones were present in both kidneys. He said that he had a friend in Sydney who had consulted about six urologists, none of whom could do anything for him. He sent a cable to the Mayo Clinic and received a reply to the effect that he could be treated there. The patient went over to the Mayo Clinic, where one kidney was dealt with first, spinal anaesthesia being used. He then waited for two months and the other kidney was dealt with in the same way. The patient had been back in Sydney for three years and had remained free from symptoms. Dr. Sim also said that in Wagga there were two brothers who had had multiple calculi in both kidneys, and nothing was being done for them by the urologists in Sydney, although they had been consulted. One of them at the time of the meeting was desperately ill, and excretion pyelography revealed no excretion of dye at all from one kidney in an hour; there was not much function in the other kidney. Dr. Sim asked whether there was nothing that could be done for them.

DR. M. H. THOMAS referred to Dr. Kirkland's remarks about suprapubic puncture. He said that some years previously Dr. Fay Maclure had shown him (Dr. Thomas) a trochar and cannula to accommodate a number 12 rubber catheter, which he used for suprapubic puncture. Dr. Thomas had used this apparatus for five or more years and had never had any trouble. It was very valuable in an emergency. In many cases of stricture the stricture was permeable and under alcoholic or other excess it became impermeable. If in these circumstances the suprapubic catheter was left in for forty-eight hours the stricture became permeable again. Dr. Thomas had used the same apparatus on three occasions to drain successfully an interlobar pulmonary abscess. Dr. Davis had referred to a patient who had persistent phosphaturia. Dr. Thomas had recently had referred to him a girl who had been put into hospital on three occasions for recurrent cystitis. The girl entered his district and he removed a pathological appendix; but the bladder condition persisted. Her urine remained alkaline in spite of all types of treatment. A test meal

revealed that she had achlorhydria; when that condition was treated she recovered.

Dr. R. H. Bridge then referred to a type of ruptured urethra in which the prostate was torn away from the membranous urethra. It occurred in crushing injuries to the pelvis. The intervening space filled with blood clot. The essential thing in surgical treatment of the condition was to bring the torn prostate into line with the urethra. Dr. Bridge made the suggestion that it might be possible to bring the prostatic portion of the urethra into approximation by putting in a Foley catheter and giving a slight pull. Dr. Telfer had referred to prostatic massage. Dr. Bridge said that prostatic massage when properly carried out was a fine therapeutic measure; but it was much overdone. Practitioners did not seem to understand its object. He had seen patients who had had prostatic massage for months on end. Such patients became prostate conscious, and long after their prostatitis was cured, either by massage or by Nature, they were never happy unless someone was putting a finger in their rectum and emptying their prostate. It was very difficult to persuade them to do without prostatic treatment. Dr. Harris had referred to post-operative infection. Dr. Bridge said that it was a fact (in the case of women and probably in that of men) that when a patient in bed after an operation asked for a bed pan she did not really empty her bladder. If the nursing was careless it was easy to see how post-operative cystitis could develop.

Dr. Kirkland, in reply, said that he differed from Dr. Laidley only in thinking that what had to be done to the urethra should be done at once. He had seen many tragedies caused by the leaving of the ends of the urethra unapposed. Dr. Sim's explanation of the absence of abnormal appearances in skiagrams and excretion pyelograms made immediately after an attack of acute renal colic was quite a reasonable one. It was borne out by the fact that if a retrograde pyelogram was followed by an excretion pyelogram, very poor pictures were obtained and diagnosis was not possible. Some days should elapse after the acute attack before full radiographic examination was made. Dr. Kirkland thought that Dr. Sim, owing to his stay in the country, had not realized all that had been going on in Sydney during past years; the technique he had described as being carried out at the Mayo Clinic was now carried out in Sydney—in fact, it was the general routine treatment nowadays for multiple calculi in both kidneys. With regard to Dr. Thomas's remarks about suprapubic puncture, Dr. Kirkland said that he almost agreed with what Dr. Thomas had said, that in an emergency suprapubic puncture was often safe. But he thought that often the peritoneum would be punctured also. Dr. Kirkland thought that Dr. Thomas safeguarded his patients to a large extent by leaving in a catheter. The patient was under surgical supervision so long as the catheter remained in position, and the danger of suprapubic cellulitis was avoided. But still, in the presence of gross abnormality, whether of the urethra or of the bladder neck, the safest measure was suprapubic cystotomy.

Dr. Edwards, in reply to Dr. Davis's question about the patient with persistent phosphaturia, suggested to Dr. Davis that he should find out whether his patient harboured a urea-splitting organism. If so, acid treatment would do more harm than good. Hypochlorhydria was nearly always present with phosphaturia.

Dr. Laidley said that he wished to quote a case which was instructive in several points with regard to Dr. Telfer's talk on prostatitis. Two or three years earlier a colleague had referred to him a middle-aged man who had had an increasing degree of arthritis in the spine, which had been preventing him from following his usual occupation and playing golf, and he was becoming more and more of an invalid. The patient went to Dr. Laidley with a request for prostatic massage. Dr. Laidley carried out the procedure on one occasion and obtained a very good specimen of fluid: there were no pus cells in it, and Dr. Laidley reported that the prostate was not the cause of the patient's arthritis. Some months passed and the same doctor sent the man along again for massage of the prostate. This time Dr. Laidley carried out the procedure on three occasions. On the first two no pus cells were present; on the third the secretion consisted of 50% pus. Treatment was instituted and to a large degree the patient's arthritis was relieved; he was able to play a round of golf and got a reasonable amount of enjoyment out of life. That was the first lesson Dr. Laidley learned—that for diagnostic purposes the prostate should be massaged three times. The second lesson was learnt when he went back into the patient's history. Some three years before the onset of the arthritic symptoms the patient had had an appendectomy, which had been followed by retention of urine, and a catheter was passed once. He had quite overlooked the procedure; but on being reminded of it he remembered that for some months after-

wards he had had some escape of prostatic secretion. Dr. Laidley had no doubt that this caused the prostatitis that brought about the long-standing arthritis.

Another case, of the avitaminosis type mentioned by Dr. Edwards, was that of a young school teacher who had been for many months in the west of New South Wales during a drought season and had lived on condensed milk and biscuits. He was brought to Sydney, looking the very picture of advanced urinary tuberculosis and with hæmaturia. No acid-fast bacilli were found when tests were made, and an initial cystoscopy showed a severe generalized cystitis. He was in bed for a week and had a rabid appetite for green vegetables and fruit, which he was given in great quantity. No tubercle bacilli were found at any examination, and a few days later cystoscopy revealed resolving patchy cystitis. The only treatment the patient was given was a normal diet with plenty of fruit and green vegetables. He made a rapid and complete recovery.

Dr. Bridge, in reply to Dr. Maitland, said that Dr. Maitland must have misunderstood him; he said that he favoured excretion urography in every case. In reply to Dr. Sim, Dr. Bridge said that he was convinced that all patients who had suddenly had an attack of violent renal colic had a small calculus which had been impacted somewhere. When a patient had such renal colic over a long period the kidney was thrown out of action for a time. Hence the need to wait for a while before making a radiographic examination by the excretion method. With regard to Dr. Sim's remarks about the treatment of multiple stones in both kidneys, Dr. Bridge said that he could only repeat Dr. Kirkland's statement that the technique described as in use at the Mayo Clinic was in use in Sydney.

Dr. WILFRED VICKERS, from the chair, said that all the papers had been most interesting and that those present were indebted to the Section of Urology for having arranged the evening.

Post-Graduate Work.

DEMONSTRATIONS OF THE FUNDUS OCULI AT SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that the following demonstrations of the *fundus oculi* will be held during July, 1941.

Wednesday, July 2, beginning at 2 p.m., at Sydney Hospital: arranged by Dr. R. B. North.

Tuesday, July 22, beginning at 2.30 p.m., at Royal Prince Alfred Hospital: arranged by Dr. E. A. Brearley.

A fee of one guinea will be charged for attendance at each of these demonstrations, except in the case of medical officers of the defence forces on full-time service, who are invited to be present free of charge. As there are only a few vacancies in both demonstrations, applications, accompanied by a remittance for the amount of the fee, should be forwarded, as soon as possible, to the Secretary of the Post-Graduate Committee at the Prince Henry Hospital, Little Bay, New South Wales.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 105, of May 29, 1941.

CITIZEN NAVAL FORCES OF THE COMMONWEALTH. Royal Australian Naval Reserve.

Promotion.—Surgeon Lieutenant-Commander Gavin Holme Cameron is promoted to the rank of Surgeon Commander, with seniority in rank of 31st December, 1940, dated 17th February, 1941.

AUSTRALIAN IMPERIAL FORCE. Australian Army Medical Corps.

To be Majors.—Captain (Temporary Major) H. H. Stewart, 21st April, 1941, and Captain R. Dick, 1st April, 1941.

To be Captains.—Captains D. J. Brennan and C. R. Dunkley, 1st May, 1941, and Honorary Captain M. F. A. Woodruff, 21st April, 1941.

To be Captains—Captains H. R. T. Hodgkinson, 1st May, 1941; M. G. F. Donnan, 1st March, 1941; J. Z. Hule, R. G. Lyne, E. W. Sibree, H. J. Delohery, V. M. Putland and M. J. McNamara, 1st May, 1941; T. Godlee, 1st April, 1941; and J. R. O. Roger, L. Abramovitch and W. J. Skinner, 1st May, 1941; C. W. Taylor, 1st March, 1941; M. Goldman, A. D. Reid and F. R. Magarey, 1st April, 1941; and J. H. Johnston, W. Gove, K. S. Wallace and R. B. Lynch, 1st May, 1941.

Lieutenant-Colonel J. R. M. Beith, D.S.O., relinquishes the command of a Hospital Ship, 20th April, 1941, and is Super-numerary to Establishments, 21st April, 1941.

Lieutenant-Colonel J. R. Donaldson is transferred from the General List and is appointed to command a Hospital Ship, vice Lieutenant-Colonel J. R. M. Beith, D.S.O., 21st April, 1941.

The appointment of Colonel Sir T. P. Dunhill, K.C.V.O., C.M.G., as Consulting Surgeon, is terminated, 31st May, 1941, and he is transferred to the Retired List, 3rd Military District, with permission to retain his rank and wear the prescribed uniform, 1st June, 1941.

Captain V. G. Bristow is transferred from Reinforcements with regimental seniority in accordance with Army seniority in the Australian Military Forces, 1st April, 1941.

To be Colonels (temporarily)—Lieutenant-Colonels H. G. Furnell, J. K. Adey, O.B.E., and F. H. Beare, E.D., 16th February, 1941.

To be Lieutenant-Colonels (temporarily)—Majors H. McLorinan, G. B. G. Maitland, D.C.M., D. M. Salter and N. H. W. Saxby, 16th February, 1941, and R. H. Russell and to command a Field Ambulance, 8th March, 1941.

To be Majors (temporarily)—Captains K. B. Armstrong and J. F. McCulloch, 1st November, 1940; J. Kingsley, J. M. Blair, I. H. Sender, C. R. Blomfield, L. E. Rothstadt, R. H. Macdonald, W. K. Myers and G. T. Gibson, 16th February, 1941; and C. D. Donald, C. Gurner, B. M. Carruthers, R. S. Smibert, F. D. Stephens and A. L. Carrodus, 18th March, 1941.

AUSTRALIAN MILITARY FORCES.

AUSTRALIAN ARMY MEDICAL CORPS.

Northern Command.

First Military District.

Reserve of Officers.—*To be Honorary Major*—Aubrey David Dick Pye, 31st March, 1941. *To be Honorary Captain*—Alexander Dennis Isles, 8th April, 1941.

Eastern Command.

Second Military District.

Honorary Captain E. W. Ferguson is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally), 25th March, 1941; Captain (provisionally) D. C. Williams is transferred from Australian Army Medical Corps, 1st Military District, 26th March, 1941; Captain (provisionally) C. T. Petherbridge is transferred to the Reserve of Officers (A.A.M.C.), 1st Military District, 26th March, 1941; the name Graeme Alvin Robson appearing in Executive Minute No. 48/1941, promulgated in *Commonwealth Gazette* No. 50 of 1941, is amended to read Alvin Graeme Robson. *To be Captain (provisionally)*—Stanley Boyd McKellar White, 8th April, 1941.

Reserve of Officers.—*To be Honorary Captains*—Roden Crichton Scoble, 7th April, 1941; and Frederick William Buddee, 8th April, 1941.

Southern Command.

Third Military District.

Major S. T. Appleford is appointed from the Reserve of Officers (A.A.M.C.), 4th March, 1940. Honorary Captain W. I. E. MacKenzie is appointed from the Reserve of Officers (A.A.M.C.) and is seconded, 1st November, 1940. *To be Lieutenant-Colonel (temporarily)*—Captain (Temporary Major) R. G. Worcester, 1st February, 1941. *To be Major (temporarily)*—V31801 Captain (provisionally) G. J. McC. Stoney, 25th March, 1941.

Reserve of Officers.—*To be Honorary Captains*—Thomas Osler Sayle, 8th April, 1941; John Francis Adamson, Herbert Oswald Johnston, and Leslie Proud Walt, 10th April, 1941.

Fourth Military District.

Reserve of Officers.—*To be Honorary Captains*—Marshall Gladstone Gratton, 3rd April, 1941, and Roman Shatlin, 8th April, 1941.

Western Command.

Fifth Military District.

Major J. P. Kenny is appointed from the Reserve of Officers (A.A.M.C.), 13th November, 1940 (in lieu of the notification respecting this officer which appeared in Executive Minute No. 235/1940, promulgated in *Commonwealth Gazette*, No. 1 of 1941).

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

Flight Lieutenant H. A. F. Rofe is granted the acting rank of Squadron Leader, with effect from 26th April, 1941.

Geoffrey Hagarty, M.B., B.S., is granted a commission on probation with the rank of Flight Lieutenant, with effect from 28th April, 1941.

Clive Moodie Waters is granted a commission on probation with the rank of Pilot Officer, with effect from 21st April, 1941.

Reserve: Medical Branch.

The following are granted commissions on probation with the rank of Flight Lieutenant, with effect from dates indicated: Harold George Rich, M.B., B.S., 1st October, 1940; Ronald Gordon Baker, M.B., B.S., 29th April, 1941.

The appointment of Flight Lieutenant J. P. Findlay is terminated, with effect from 17th June, 1940.—(Ex. Min. No. 80—Approved 28th May, 1941.)

DECORATION.

SURGEON-LIEUTENANT ALLAN GORDON CAMPBELL, of the Royal Australian Naval Reserve, has been awarded the Distinguished Service Order for service in connexion with the withdrawal from Greece.

CASUALTIES.

ACCORDING to the casualty list received on June 3, 1941, Major A. W. L. Row, A.A.M.C., of Toowoomba, Queensland, has been removed from the seriously ill list.

Captain E. V. Barling, A.A.M.C., of Stanmore, New South Wales, Captain J. W. McNamara, A.A.M.C., of Mosman, New South Wales, Captain F. G. Meyer, A.A.M.C., of Camperdown, New South Wales, Captain N. H. Rose, A.A.M.C., of Sydney, and Major B. Moore, A.A.M.C., of Bathurst, New South Wales, are reported missing.

Correspondence.

"ALCOHOLICS ANONYMOUS."

SIR: Your current comment "Alcoholics Anonymous", in the journal of May 10, page 587, prompts me to mention that the method employed by this group in the cure of alcoholism has been fully set out in a book, "Alcoholics Anonymous", published by the Works Publishing Company, New York, at \$3.50.

The book has been written by a hundred cured alcoholics in collaboration. The first part sets out the method of treatment, which appears to be an application of Oxford Group teaching. In the second part a number of cured alcoholics tell their life stories and how they achieved cure. The psychology of the addict as revealed in these stories is most illuminating. The book is one of the most unusual I have read.

The steps in the programme of recovery are, in brief, as follows:

- (1) We admitted we were powerless over alcohol—that our lives had become unmanageable.
- (2) Came to believe that a Power greater than ourselves could restore us to sanity.
- (3) Made a decision to turn our will and our lives over to the care of God as we understood Him.
- (4) Made a searching and fearless moral inventory of ourselves.
- (5) Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
- (6) Were entirely ready to have God remove all these defects of character.
- (7) Humbly asked Him to remove our shortcomings.
- (8) Made a list of all persons we had harmed, and became willing to make amends to them all.
- (9) Made direct amends to such people wherever possible, except where to do so would injure them or others.
- (10) Continued to take personal inventory and when we were wrong promptly admitted it.

(11) Sought through prayer and meditation to improve our conscious contact with God *as we understood Him*, praying only for knowledge of His will for us and the power to carry that out.

(12) Having had a spiritual experience as the result of these steps, we tried to carry this message to alcoholics, and to practise these principles in all our affairs.

Each of these steps is elaborated in the book, and numerous hints are given as to the approach to the alcoholic and the helping of him at each step.

It should be emphasized that to bring about a cure it is essential to have the willing and determined cooperation of the patient. A half-hearted desire for cure is not enough, for the way to victory is long and hard. For those who are prepared to face the steps, the method works, as the 100 patients of this book or the 920 of the later report can testify.

The treatment of alcoholic addiction has been in the past so disappointing that one welcomes a method that can give such results.

The nucleus of an "Alcoholics Anonymous" group exists in Brisbane.

Yours, etc.,

E. H. DERRICK.

557, Milton Road,
Toowong,
Brisbane.
May 26, 1941.

THE LATE GEORGE ADLINGTON SYME'S SERVICE IN EGYPT.

SIR: In my Syme Oration I included a story about the incongruous duties allotted to the late Sir George Syme during his service in Egypt in the last war. The story is not true, and I hasten to publish the facts as stated by Sir James Barrett in a letter dated May 26, 1941, which I have just received from him.

No. 1 A.G.H. in Egypt was forced to form a V.D. and Measles Camp away from the Hospital, and the O.C., Colonel Ramsay Smith, consulted me [Sir James Barrett] about it. I advised him to call in the Chief Surgeon Syme and the Chief Physician Maudsley and discuss it. He did so and all agreed that one of the Staff must take charge of it. Syme volunteered, but the O.C., whilst expressing his appreciation of the offer, said he could not spare him, and he appointed someone else.

I was quite unaware of these facts when I prepared my oration, and I am sorry that the story was included.

The facts as told by Sir James redound to the credit of Syme and show the man's humility and the depth of his desire to serve his country. May those virtues serve as an example to others today.

Yours, etc.,

H. S. NEWLAND.

A.M.P. Building,
23, King William Street,
Adelaide.
May 28, 1941.

Obituary.

JOHN FERGUSON CHAMBERS.

We are indebted to Dr. H. Boyd Graham for the following appreciation of the late Dr. John Ferguson Chambers.

John Ferguson Chambers was killed by shell fire recently at Tobruk. He was a specialist physician, but the fortunes of war made a forward area of the location of the hospital.

He was born on September 9, 1894, at Graceville, Brisbane, Queensland. The son of the general manager of the Union Bank of Australia, John Chambers was educated at the Sydney Grammar School, but did his medical course at the University of Melbourne and subsequently obtained the M.D. degree there in 1925. He served in the Australian Imperial Force in 1917 and 1918 as a captain in the Australian Army Medical Corps. Afterwards he returned to England and became a member of the Royal College of Physicians in London in 1922 and gained experience on the staff of Saint Thomas's Hospital, London.

When he returned to Melbourne in 1923 he entered upon private practice in Collins Street. He was associated with

the honorary medical staff at the Alfred Hospital and at the Austin Hospital, Melbourne, becoming an in-patient physician at the Alfred Hospital and a consulting physician at the Austin Hospital. He was a Foundation Fellow of the Royal Australasian College of Physicians.

On September 3, 1924, he married Helen, daughter of the late Robert Gordon Craig, of Sydney. They have two sons, fourteen and fifteen years of age. The colleagues of the late Dr. Chambers join with his many friends outside the profession in mourning his loss and in sympathy with his family.

JOHN KILDAHL RICHARDS.

We are indebted to Dr. A. C. H. Salter for the following account of the career of the late Dr. John Kildahl Richards.

Dr. Richards was born at Soldier's Hill, Ballarat, and received his earlier education at the Ballarat College, for the old school tie of which he had a lasting affection.

He graduated from Edinburgh University, where he took the degrees of M.D., Ch.M., and then practised for a short time in the south of Scotland. Returning to Ballarat, he put up his plate in Soldier's Hill and conducted his practice in that locality for some forty-four years, ultimately becoming, and proud he was of it, the senior practitioner of Ballarat. Dr. Richards also acquired the degree of M.D. (Melbourne). He was a past-president of the Ballarat Subdivision of the Victorian Branch of the British Medical Association and was connected with various local institutions and organizations. After acting for many years as honorary physician to the Ballarat Base Hospital, he was appointed honorary consulting physician and maintained to the last a keen interest in its development and activities, the same being shared by the Ballarat Orphanage, of which he was a committeeman for twenty-six years and president on more than one occasion.

Having been honorary medical officer of the Old Colonists' Association for thirty-three years, he gave devoted attention to the occupiers of the "Old Colonists' Homes", and his frequent visits will be sadly missed by these and others of his aged patients.

Quite a few of his patients were contemporaries of his in his early Ballarat days, and by them he was affectionately known as "Dr. Jack".

He gave lengthy service in the Great War, mostly in Egypt; and in the present war he promptly put himself in the hands of the Defence Department, but in spite of his old enthusiasm, his constitution was not able to stand camp life for more than a short period and he was forced to return to civilian practice, which he carried on quietly for some months. His health again breaking down, he was advised to take a rest, and after two weeks the end came suddenly.

We mourn the passing of a loyal colleague and a Christian gentleman of most kindly and sympathetic bearing.

CHARLES HENRY SCOTT.

We regret to announce the death of Dr. Charles Henry Scott, which occurred on June 4, 1941, at Lindfield, New South Wales.

HERBERT ZOUCHE THROSBY.

We regret to announce the death of Dr. Herbert Zouch Throsby, which occurred on June 6, 1941, at Bundanoon, New South Wales.

MEDICAL WAR RELIEF FUND.

THE following is a seventh list of contributions to the Medical War Relief Fund established by the Federal Council of the British Medical Association in Australia for the relief of distressed medical practitioners in Great Britain.

Victoria.

£52 10s.: Dr. L. J. C. Clendinnen, Dr. R. Kaye Scott and Dr. H. F. Praagst (joint contribution). Dr. Ivan Maxwell.

£50: "Anonymous."

£25: Dr. Archie Anderson.

£21: Dr. R. W. Chambers, Members of the Melbourne Radiological Clinic.

- 120: Dr. D. Nance, Dr. B. Milne Sutherland.
 110 10s.: Dr. E. A. Mackay, Dr. B. T. Zwar.
 110: Dr. H. C. Maling, Dr. R. E. Short.
 15 5s.: Dr. Esme Anderson, Dr. Margaret Winter Ashton, Dr. R. C. Brown, Dr. J. S. Buchanan, Dr. K. L. Chambers, Dr. J. Clough, Dr. H. C. Colville, Dr. E. G. Dahlenburg, Dr. A. Roberta and Dr. Agnes Donaldson (joint contribution), Dr. K. D. Fairley, Dr. Robert Fowler, Dr. E. Gutteridge, Dr. B. R. Hallows, Dr. C. H. Hembrow, Dr. John Kennedy, Dr. L. Loocham, Dr. M. Meyer, Dr. C. H. Mollison, Dr. A. B. McCutcheon, Dr. R. G. McPhee, Dr. T. V. Nihill, Dr. M. C. Patrick, Dr. W. H. Rennick, Dr. H. E. Robinson, Dr. M. W. Rosenthal, Dr. D. M. Seeley, Dr. G. R. A. Syme, Dr. B. Gretton-Watson, Dr. G. Raleigh Weigall.
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 13 3s.: Dr. L. E. Clay, Dr. J. Cumming Stewart, Dr. T. J. F. Frank, Dr. A. J. Frost.
 13: Dr. J. A. O'Brien.
 12 2s.: Dr. D. Bickart, Dr. Alice M. Correll, Dr. M. Crivelli, Dr. Eileen FitzGerald, Dr. H. Grover, Dr. F. W. Grutzner, Dr. Max Hoban, Dr. Marion Ireland, Dr. Hilda E. Kincaid, Dr. Frank May, Dr. J. F. Meehan, Dr. R. W. Nicholls, Dr. M. B. O'Sullivan, Dr. J. S. Rogers, Dr. D. Roseby, Dr. Guy Springthorpe, Dr. R. F. Watson.
 11 1s.: Dr. R. D. Altchison, Dr. J. Ringland Anderson, Dr. T. F. Buxton, Dr. M. Curzon, Dr. W. J. Flynn, Dr. F. R. Vincent.
 11: Dr. L. F. Edmunds.
 10s. 6d.: Dr. R. S. A. Marshman.

South Australia.

- 110 10s.: Dr. M. Schneider, Dr. H. H. Rischbeith, Dr. R. E. Magarey.
 15 5s.: Dr. R. J. Verco, Dr. G. C. Nicol, Dr. H. H. E. Russell, Dr. F. B. Turner, Dr. L. W. Linn.
 15: Dr. G. London.
 13 3s.: Dr. L. O. Betts.
 12 2s.: Dr. K. F. Cooper, Dr. J. E. Bateman, Dr. D. R. W. Cowan.
 11 1s.: Dr. O. W. Frewin.

Western Australia.

- 15 5s.: Dr. F. T. Beamish, Dr. H. Macmillan, Dr. D. D. Paton, Dr. H. R. Pearson.
 13 3s.: Dr. A. G. Abbott, Dr. M. K. Moss.
 12 2s.: Dr. W. E. Blackall, Dr. K. W. Hodby, Dr. A. Vickers, Dr. B. C. Cohen, Dr. W. H. J. Cole.
 11 1s.: Dr. K. C. Godfrey, Dr. H. G. D. Breidahl and Dr. D. Wilson (weekly contribution), Dr. W. E. Caldwell.

Australian Medical Board Proceedings.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Act, 1939*, as duly qualified medical practitioners:

McCallum, Norman Yates, M.B., B.S., 1940 (Univ. Sydney), General Hospital, Brisbane.
 Monz, Walter, M.B., B.S., 1939 (Univ. Sydney), General Hospital, Brisbane.

The following additional qualification has been registered:
 Lee, Douglas Harry Kedgwin, Brisbane (M.B., B.S., 1929, Univ. Sydney), M.D., 1940, Univ. Sydney.

Corrigendum.

DR. VERA KRIEGER writes that an error appears in her paper that was published in the issue of May 17, 1941. On page 610, at the top of the second column, the sentence should read: "The Fowweather test produced a result of 56% of the average normal function."

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Seton, Miles Carliston, M.B., B.S., 1940 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Crowley, Arthur Herbert, M.B., B.S., 1916 (Univ. Melbourne), 142, Addison Road, Manly.

Diary for the Month.

- JUNE 16.—Victorian Branch, B.M.A.: Hospital Subcommittee.
 JUNE 17.—Victorian Branch, B.M.A.: Organization Subcommittee.
 JUNE 17.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
 JUNE 17.—New South Wales Branch, B.M.A.: Ethics Committee.
 JUNE 18.—Western Australian Branch, B.M.A.: Branch.
 JUNE 19.—New South Wales Branch, B.M.A.: Clinical.
 JUNE 19.—Victorian Branch, B.M.A.: Executive.
 JUNE 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 JUNE 25.—Victorian Branch, B.M.A.: Council.
 JUNE 26.—New South Wales Branch, B.M.A.: Branch.
 JUNE 26.—South Australian Branch, B.M.A.: Branch.
 JUNE 27.—Queensland Branch, B.M.A.: Council.
 JUNE 27.—Tasmanian Branch, B.M.A.: Council.
 JULY 1.—New South Wales Branch, B.M.A.: Council (Quarterly).
 JULY 2.—Victorian Branch, B.M.A.: Branch.
 JULY 2.—Western Australian Branch, B.M.A.: Council.
 JULY 3.—South Australian Branch, B.M.A.: Council.
 JULY 4.—Queensland Branch, B.M.A.: Branch (Ordinary).
 JULY 4.—Victorian Branch, B.M.A.: Legislation Subcommittee.
 JULY 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 JULY 8.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 JULY 8.—Tasmanian Branch, B.M.A.: Branch.
 JULY 10.—Victorian Branch, B.M.A.: Ethics Subcommittee.
 JULY 11.—Queensland Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 235, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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